Biological Study of Pacific Hake, Walleye Pollock and Spiny Dogfish in the Strait of Georgia. *R/V G.B. Reed,* March 22–April 2, 1976

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June 1983

Canadian Data Report of Fisheries and Aquatic Sciences No. 398

Canadian Data Report of Fisheries and Aquatic Sciences

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Canadian Data Report of Fisheries
and Aquatic Sciences No. 398

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BIOLOGICAL STUDY OF PACIFIC HAKE, WALLEYE POLLOCK AND SPINY DOGFISH IN THE STRAIT OF GEORGIA. R/V G.B. REED, MARCH 22-APRIL 2, 1976

by

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Cat. No. Fs 97-13/398 ISSN 0706-6465

ABSTRACT

Shaw, W., G. A. McFarlane, and R. J. Beamish. 1982. Biological study of Pacific hake, walleye pollock, and spiny dogfish in the Strait of Georgia. R/V G.B. REED, March 22-April 2, 1976. Can. Data Rep. Fish. Aquat. Sci. No. 398: iv + 76 p.

A total of 20 midwater trawl sets were completed in the Strait of Georgia. The most abundant species caught was Pacific hake (Merluccius productus) with lesser amounts of walleye pollock (Theragra chalcogramma) and spiny dogfish (Squalus acanthias).

Pacific hake were present in all tows and ranged in length from 7-62 cm with the majority being adults ranging from 35-49 cm. Males dominated in 65% of all sets and composed 60% of the total catch. The age composition as determined from otolith sections ranged from 1-21 yr. Strong year-classes were evident in the Strait of Georgia population with the 1970 year-class (age 6) predominating. Maturity examinations indicated 48.2% male hake to be ripe and running and 40.0% females to be in a ripe condition.

Walleye pollock were present in all tows and ranged in length from 27-56 cm. Male pollock dominated in 40% of all sets and composed 51% of the total catch. Male modal lengths of 36 and 43 cm are smaller than the 39 and 47 cm for females. Maturity examinations indicated 52% males to be ripe and running and 15% of the females to be in a ripe condition.

Spiny dogfish were present in all sets. Males dominated in 56% of all sets and composed 63% of the total catch. A total of 721 were measured and 59.8% were $\leq$ 60 cm. Juvenile dogfish $\leq$ 60 cm predominated in depths ranging from 153-170 m (83-93 fath). The age distribution as determined from the second dorsal spines ranged from 1-52 yr of which 62% of the fish were $\leq$ 10 yr. Age 1+ dogfish averaged 35.2 cm in length. Growth increments averaged 3.5 cm for age 2+ fish and 1.6 cm for age 3+ to 10-yr-old fish. Approximately 62% of the males and 85% of the females were immature.

Key words: Pacific hake, walleye pollock, spiny dogfish, biology, Strait of Georgia.

RESUME

Shaw, W., G. A. McFarlane, and R. J. Beamish. 1982. Biological study of Pacific hake, walleye pollock, and spiny dogfish in the Straight of Georgia. R/V G. B. REED, March 22-April 2, 1976. Can. Data Rep. Fish Aquat. Sci. No. 398: iv + 76 p.

Des merlus du Pacifique (Merluccius products), l'espèce la plus abondante, des morues du Pacifique occidental (Theraga chalcogramma) et des aiguillats communs (Squalus acanthias) ont été capturés au cours de 20 mouillages de chalut mésopélagique dans le détroit de Géorgie.

Le merlu du Pacifique se retrouvait dans tous les traits et sa longueur variait de 7 à 62 cm; les adultes, en nombre supérieur, mesuraient de 35 à 49 cm. Les mâles, plus nombreux dans 65% des levés de chalut, constituaient 60% de la prise totale. L'âge, déterminé à l'aide de coupes d'otolithes, variait de 1 à 21 ans. D'importantes classes d'âge annuelles, dont celle de 1970 (6 ans) était la plus abondante, étaient présentes dans la population du détroit de Géorgie. Une étude de l'état de maturité a révélé que 48,2% des mâles étaient laités et prêts à frayer et que 40,0% des femelles étaient oeuvées.

La morue du Pacifique a été capturée dans tous les traits et sa longueur variait de 27 à 56 cm. Plus abondants dans 40% des mouillages, les mâles constituaient 51% de la prise totale. Les longueurs modales des mâles (36 et 43 cm) étaient inférieures à celles des femelles (39 et 47 cm). Une étude de l'état de maturité a révélé que 52% des mâles étaient laités et prêts à fayer et que 15% des femelles étaient oeuvées.

Des aiguillats communs ont été pêchés dans tous les mouillages dont 56% étaient composés en majorité de mâles qui constituaient 63% de la prise totale. Sur 721 aiguillats, 59,8% mesuraient 60 cm ou moins. Les juvéniles (60 cm) étaient plus abondants à des profondeurs variant de 153 à 170 cm (83 à 93 brasses). Selon les coupes de la deuxième épine dorsale, l'âge variait de 1 à 52 ans et 62% des poissons étaient âgés de 10 ans ou moins. La longueur moyenne d'un aiguillat de 1+ an s'élevait à 35,2 cm. Les augmentations de croissance totalisent en moyenne 3,5 cm chez les poissons de 2+ ans et 1,6 cm chez les poissons de 3+ à 10- ans. Environ 62% des mâles et 85% des femelles étaient immatures.

Mots-clés: merlu du Pacifique, morue du Pacifique occidental, aiguillat commun, biologie, détroit de Géorgie

INTRODUCTION

The March 22-April 2, 1976 G.B. REED cruise was a cooperative attempt to study the distribution and abundance of midwater fishes particularly Pacific hake (Merluccius productus), walleye pollock (Theragra chalcogramma), and spiny dogfish (Squalus acanthias) in the Strait of Georgia.

The purpose of this survey was to examine the species composition of the sound scatter layers detected using hydroacoustic gear. This report summarizes results of catch composition and biological studies.

METHODS

The R/V G.B. REED was used during the survey period. All tows were made using an Engel 434 midwater trawl equipped with an Elac model LAZ 17 headrope transducer and a 2.0 cm (0.8 in) mesh codend liner.

Set locations were selected on the basis of fish density as determined from a hydroacoustic echogram survey completed prior to each tow. Tows were made to identify species composition of midwater targets.

The midwater trawl catch was sorted by species individually into 55-L (12 gal) galvanized tubs and weighed using a platform balance to the nearest kilogram (kg). The major species, hake, pollock and dogfish were either sampled in their entirety, or a random sample of tubs was selected for analysis. Hake and pollock were measured for fork length and sexed. Random samples of tubs filled with hake, and total catches of pollock were sampled for maturity condition and stomach contents. Paired otoliths were collected from hake and stored in 50% glycerin water solution. Age determination procedures for otoliths are outlined in Beamish (1979).

Dogfish were measured for total length from the tip of the snout to the tip of the upper lobe of the caudal fin when depressed in a line horizontal with the body. The total catch of dogfish was sampled for maturity condition, and stomach contents and spines were taken from the second dorsal fin for age determination. The method of estimating the age is described in Ketchen (1975) except that all ages were calculated from birth.

Both hake and dogfish body weights were weighed to the nearest gram using a Digimetric 30 DTI top loading balance equipped with a digital integrator.

Incidental catches of brown cat shark were sampled for total length while chinook salmon, eulachon, Pacific cod and splitnose rockfish were measured for fork length. Their maturity conditions and stomach contents were sampled when time permitted.

RESULTS AND DISCUSSION

GENERAL CRUISE SUMMARY

During March 22-April 2, a total of 20 midwater tows were made from Mitlenatch Island area to Point Roberts (Taylor and Barner, 1976; Fig. 4). Detailed records of the set locations are in Appendix Table 1.

A complete description of the sound scatter layers defining the distribution of hake and pollock is given by Taylor and Barner (1976). Their results indicate a diffuse layer present throughout the Strait starting from about 100 m (55 fath) and extending to the bottom. This layer varied in density with depth and area fished. It was apparent that the 100-300 m (55-164 fath) depth layer was better defined in some areas during this cruise than earlier in January, however it was still relatively weak. No identifiable layer was encountered from 10-100 m (5-55 fath), and no recognizable, discrete schools were observed within the diffuse layer (Taylor and Barner 1976).

All sets were made through the main concentration layer at depths > 100 m (55 fath) at the same set locations as those completed on the January cruise by Cass et al. (1980).

A total of 16 species of fish were captured and are listed by haul in Appendix Table 2. A list of the common and scientific names of the species caught is in Appendix Table 3.

The most abundant species caught was Pacific hake. Walleye pollock, spiny dogfish, northern lampfish (Stenobrachius leucopsarus), eulachon (Thaleichthys pacificus), and northern smoothtongue (Leuroglossus stilbius schmidti) were common in the sets. Other species caught amounted to less than 40 individuals in the total sets.

The mean catch rates of hake, pollock and dogfish during the survey was 363 kg/hr, 78 kg/hr and 88 kg/hr respectively (Table 1).

High catch rates for hake were recorded off Gabriola Island-Sand Heads area, and from the north Halibut Bank area. The catch rates averaged 910 kg/hr (sets 4 and 6) and 744 kg/hr (set 2) respectively. These sets were made between 216 (118 fath) and 220 m (120 fath) in depth.

High catch rates for pollock averaged 251 kg/hr (sets 7-9) and 340 kg/hr (set 2) for Roberts Bank and north Halibut Bank respectively. The depth ranges of these tows were from 132-216 m (72-118 fath).

Dogfish catch rates were high off Hornby Island, Roberts Bank and north Ballenas Basin, 358 kg/hr (set 12), 206 kg/hr (set 8) and 192 kg/hr (set 3) respectively. These tows ranged from 152-198 m (83-108 fath) in depth.

PACIFIC HAKE

Pacific hake were sampled in all sets. A total of 5,665 hake were measured and sexed. A summary of the biological samples collected is in Table 2.

Male hake composed 60% of the total catch (excluding unsexed fish) and dominated in 65% of all sets. The depth range of tows from which samples were taken was from 132-325 m (72-178 fath) of which 60% of the tows were $\geq$ 180 m (98 fath). Male hake predominated in sets made at the deeper depths. Segregation by sex with depth is well documented (Beamish et al. 1978; Cass et al. 1978, 1980).

Hake ranged in length from 7-62 cm with the majority being adults ranging from 35-49 cm (Appendix Table 4). Four distinct modal lengths are evident from the length frequency distribution at 10, 24, 39, and 44 cm (Fig. 1). Male hake ranged in length from 17-55 cm. Female hake ranged in length from 10-62 cm.

The age distribution determined from 448 otoliths ranged from 1-21 yr. The mean length at age curves are consistent with those observed in previous studies (Beamish et al. 1978; Cass et al. 1978). The growth is rapid to age 4 with a subsequent reduction in growth for older aged fish (Fig. 1, Table 3).

The presence of strong year-classes is evident in the age composition of hake in the Strait of Georgia (Fig. 2). The dominant year-classes influencing the age structure of the stock are the 1970 (predominating), and 1959, represented by 6- and 17-yr-olds respectively.

Gonads were examined from 1015 males and 767 females (Table 4). A description of the maturity code is in Table 5 (Weir et al. 1978 and McFarlane et al. 1982). The majority of the males (48.2%) examined were in a ripe and running condition (RR), with only 0.4% being spent (S). Females were mostly (40.0%) in a ripe (R) condition with only 1.3% in a ripe and running (RR) condition and 4.0% in a resting (R_t) condition. No spent female gonads were observed. It is apparent that spawning was occurring but had not yet peaked.

Individual round weights were recorded from 85 hake. These data produced an exponential curve for sexes combined (Fig. 3). The parameters a and b were estimated and incorporated into the following equation:

$$W = aL^b$$

The length-weight relation for sexes combined:

$$Wt\ (gm) = 0.0033\ (FL\ (cm))^{3.1726}$$

A total of 1333 hake were examined for stomach contents (Table 6). Approximately 45 and 39% of the stomachs examined were empty and everted respectively. The average stomach content was 0.89 cc/fish (excluding everted stomachs). Young-of-the-year hake was the principal fish species in the diet, (18.2% by volume). Glass shrimp was the dominant invertebrate item, (15.2% by volume).

WALLEYE POLLOCK

Walleye pollock were present in all sets. A total of 1339 pollock were measured and sexed. A summary of the biological samples collected is listed in Table 7.

Male pollock composed 51.0% of the total catch and dominated in 40.0% of all sets. Female pollock contributed 17.3% above 200 m (110 fath) depth and 31.7% $\geq$ 200 m (110 fath) depth towards the total catch.

Pollock ranged in length from 27-56 cm with the majority of the fish in the 35-43 cm range (Appendix Table 5). From the length frequency histogram two distinct modal lengths exist for each sex (Fig. 4). Male modal lengths were 36 and 43 cm. Female modal lengths were 39 and 47 cm.

Pollock $\geq$ 50 cm accounted for 1.9% of the total catch with females attaining the larger sizes.

Gonads were examined from 421 males and 485 females from 19 sets (Table 8). A description of the maturity codes is in Table 9 (Weir et al. 1978 and McFarlane et al. 1982). Immature male and female pollock amounted to 6.7% of the total number sampled. The majority of these were found in 216 m (118 fath) depth (set 2), south of Merry Island. The majority of the males (52.0%) examined were in a spawning condition (RR). The majority of the females (15.0%) had ripe (R) ovaries, and 9-12% were developing into a spawning condition (1R-RR). Only 9% of the males and females examined had spent (S) gonads, and 29 and 21% respectively were observed to be in a post-spawning stage (Rc and Rt).

Stomach contents were examined from a total of 460 pollock from 15 sets (Table 10). Sixty-nine percent of the fish examined had empty stomachs and 3% had everted stomachs. The principal food consisted of amphipods (26.8%) with euphausiids accounting for 24.5% by volume. Of the remaining, unidentified fish remains and eulachon accounted for 11.7 and 11.2% by volume respectively. The mean stomach content by volume (excluding pollock with everted stomachs) was 0.81 cc.

LAMPREY SCARS

All pollock sampled were examined for scars resulting from lamprey attacks. Only one pollock (0.07%) was observed with scars.

A total of 3 Pacific lamprey (Lampetra tridentata) were found in only three sets (2, 11 and 19). The depth of capture ranged from 201-216 m (110-118 fath). The Pacific lamprey from sets 11 and 19 were each 23.1 cm long and weighed 31.0 gm and 25.8 gm respectively.

SPINY DOGFISH

Spiny dogfish were present in all sets. A total of 721 dogfish were measured and sexed from 18 sets. A summary of the biological samples taken is presented in Table 11. Males composed 63% of the total catch and dominated in 56% of the sets.

Dogfish ranged in length from 23-124 cm (total length). Approximately sixty percent (juvenile fish) were $\leq$ 60 cm (Appendix Table 6, Fig. 5)). Juvenile dogfish $\leq$60 cm predominated in depths ranging from 152-170 m (83-93 fath).

Ages were determined from a total of 200 spines using the method described by Ketchen (1975). The dogfish ranged in age from 1-52 yr. Sixty-two percent were $\leq$ 10 yr (Fig. 5).

Dogfish growth is relatively rapid during the first two years. Growth after age 1+ (average length of 35.2 cm) increased by 3.5 cm/yr for age 2+ dogfish (Table 12, Fig. 5). From age 3+ to age 10, dogfish grew approximately 1.6 cm per year. There was no obvious difference in the average size of similar-aged male and female dogfish (Tables 13-14).

Individual round weights were recorded from 535 dogfish of which 77% were $\leq$ 60 cm. The length-weight relationship is presented in the following equation:

$$W = aL^b$$

Since the majority of the fish weighed were $\leq$ 60 cm a length-weight relationship for male plus female dogfish measuring $\leq$60 cm is:

$$Wt\ (gm) = 0.0036\ (TL(cm))^{3.00053} \qquad n = 410 \quad \text{(Fig. 6)}$$

This relationship is similar to the relationship estimated by Cass et al. (1980).

Gonads were examined from 452 males and 267 females (Table 15). A description of the maturity codes is in Table 16 (Beamish and Smith 1976, McFarlane et al. 1982). Approximately 62% of the males and 85% of the females were immature. Mature females containing yolk sacs (R_3D_6) accounted for 1.5% of the total number sampled.

Stomach contents were examined from 721 dogfish in all sets (Table 17). Approximately 51% of dogfish $\leq$ 60 cm, and 38% of dogfish > 60 cm had empty stomachs. Dogfish $\leq$60 cm fed mostly on planktonic invertebrates, 58% by volume. The dominant invertebrate food item was euphausiids, 17% by volume. Fish species were of lesser importance, with Leuroglossus being the major fish species consumed, 7% by volume.

The principal food item for adult dogfish >60 cm was Pacific hake and Pacific herring (Clupea harengus pallasi) 39 and 28% by volume respectively. Squid represented 9% by volume in the diet.

BROWN CAT SHARK

Brown cat shark were present in 7 of the 20 sets. A summary of the biological samples collected is presented in Table 18. The depth of capture ranged from 165-293 m (90-160 fath) with the majority caught deeper than 200 m (110 fath). A total of 16 brown cat shark were measured and sexed of which 67% were males and 33% were females. Brown cat shark ranged in total length from 39-56 cm (Appendix Table 7). Males ranged from 46-56 cm and females ranged from 39-49 cm. All but one brown cat shark examined for maturity stage were mature. Stomach contents consisted mostly of northern smoothtongue, glass shrimp and hake.

OTHER SPECIES SAMPLED

A summary of the biological sample collected by species is in Table 15. Eulachon were sampled in set 7, of which 171 fish were measured for length. Their length frequency ranged from 16-22 cm with a modal length at 19 cm. One male chinook salmon from set 9 measured 37 cm; two female Pacific cod, from sets 1 and 12, were measured at 50 and 68 cm respectively; five splitnose rockfish were sampled for length and sex from set 12 with one male measuring 30 cm and 4 females ranging in lengths 24-30 cm. The length frequencies of these 4 species are presented in Appendix Table 8.

ACKNOWLEDGMENTS

The authors would like to thank the captain and the crew of the R/V G.B. REED and the staff members of the Groundfish Program, Mike Smith, Alan Cass and Keni Weir, who participated in collecting and organizing the biological data.

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Table 1. Catch rates of Pacific hake, walleye pollock, and spiny dogfish by set and by depth towed. G.B. REED, March 22-April 2, 1976.

Set no.	Duration (min)	Net depth (m)	Catch rates		
			Pacific hake kg/hr	Walleye pollock kg/hr	Spiny dogfish kg/hr
1	30	256	10	18	44
2	30	216	744	340	60
3	30	198	410	42	192
4	30	220	1158	80	136
5	30	200	220	44	56
6	30	217	2184	32	26
7	30	132	18	138	38
8	30	165	123	386	206
9	30	201	310	228	122
10	30	293	38	74	56
11	30	132	280	4	31
12	31	152	72	9	359
13	30	220	628	5	50
14	27	325	76	34	8
15	30	180	24	12	142
16	30	170	68	2	60
17	30	201	114	6	32
18	30	201	86	24	34
19	30	206	414	16	22
20	30	183	286	64	28
Mean (kg/hr)			363	78	88

Table 2. Summary of biological samples collected from Pacific hake by set. G.B. REED, March 22- April 2, 1976.

Set no.	Fork length			Maturity	Stomach contents	Otoliths	Wt[a]	Sampling remarks
	Male	Female	Total					
1	5	4	9	9	9	-	-	Total catch
2	400	212	832	254	100	-	-	Total catch
3	318	136	482	194	-	-	-	Total catch
4	185	351	537	159	102	448	-	Random 7 of 13 tubs
5	141	116	257	-	-	-	-	Total catch
6	124	116	471	-	-	-	-	Total catch
7	0	13	13	13	13	-	-	Total catch
8	37	74	133	109	111	-	-	Total catch
9	252	104	357	-	-	-	-	Total catch
10	56	52	111	108	109	-	-	Total catch
11	250	97	358	102	102	-	-	Total catch
12	23	56	119	76	79	-	-	Total catch
13	315	213	528	154	100	-	-	Total catch
14	21	40	61	58	61	-	-	Total catch
15	7	19	36	26	26	-	-	Total catch
16	18	23	41	41	41	-	24	Total catch
17	96	28	164	124	124	-	47	Total catch
18	80	37	129	99	100	-	14	Total catch
19	355	127	516	180	180	-	-	Total catch
20	219	97	511	76	76	-	-	Total catch
Total	2909	1915	5665	1782	1333	448	85	

[a]Body weight in the round.

Table 3. Mean size of Pacific hake for each age class in set number 4. G.B. REED, March 22-April 2, 1976.

	Male			Female			Total		
Age	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	N
1							11.0	0.00	1
2	24.3	2.34	6	24.7	1.37	6	24.0	1.83	12
3	35.7	0.82	6	37.0	3.46	6	36.3	2.50	12
4	39.7	2.41	20	40.2	2.29	30	40.0	2.33	50
5	42.5	1.88	20	44.0	2.21	41	43.5	2.20	61
6	43.5	1.99	36	44.9	2.21	94	44.5	2.23	130
7	43.2	3.19	9	44.2	2.32	11	43.8	2.71	20
8	47.0	1.87	5	47.9	4.67	14	47.7	4.08	19
9	44.9	2.03	8	45.5	3.69	10	45.2	3.00	18
10	45.5	0.71	2	46.3	2.14	7	46.1	1.90	9
11	44.5	1.76	6	50.8	2.31	8	48.1	3.79	14
12	43.0	2.00	3	46.9	2.68	16	46.3	2.92	19
13	44.8	0.84	5	47.7	2.13	14	46.9	2.27	19
14	43.5	2.12	2	45.7	1.53	3	44.8	1.97	5
15	0	0	0	45.5	4.00	8	45.5	4.00	8
16	46.0	0.00	1	44.0	0.89	6	44.3	1.11	7
17	44.1	2.74	11	45.8	2.49	23	45.2	2.65	34
18	45.7	2.52	3	42.3	1.53	3	44.0	2.61	6
19	44.0	1.41	2	48.0	0.00	1	45.3	2.52	3
20	-	-	-	0	0	0	0	0	0
21	-	-	-	45.0	0.00	1	45.0	0.00	1
Total			145			302			448

Table 4. Pacific hake maturity stages by set. G.B. REED, March 22-April 2, 1976.

Gonad maturity stage	Set no. 1		2		3		4		7		8		10		11	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
I_1	–	–	10	15	9	9	5	3	–	–	6	5	47	38	–	1
I_2	–	–	2	3	2	1	1	1	–	–	0	2	2	7	11	2
R_1	1	–	33	12	8	4	1	1	–	3	1	12	3	1	41	3
R_2	3	4	31	31	14	17	7	20	–	1	6	17	3	4	17	8
R	0	–	5	35	7	28	5	66	–	6	1	33	0	0	1	14
1R	0	–	0	0	0	0	0	4	–	0	0	0	0	0	0	0
2R	0	–	0	0	0	1	0	9	–	0	0	1	0	0	0	0
RR	1	–	70	4	94	–	33	1	–	0	21	0	1	0	3	1
S	–	–	2	0	–	–	0	0	–	0	–	0	–	0	–	–
R_b	–	–	—	0	–	–	0	0	–	0	–	0	–	0	–	–
R_c	–	–	–	0	–	–	1	0	–	0	–	0	–	0	–	–
R_t	–	–	—	1	–	–	–	1	–	3	–	4	–	2	–	–
Total	5	4	153	101	134	60	53	106	–	13	35	74	56	52	73	29
Net Depth(m)[a]	256		216		198		220		132		165		293		201	

Gonad maturity stage	Set no. 12		13		14		15		16		17		18		19	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
I_1	9	10	–	–	1	1	1	4	7	8	13	13	–	–	–	–
I_2	5	10	–	1	0	0	2	0	5	1	0	0	7	5	4	6
R_1	6	14	3	0	0	1	0	3	4	1	1	0	18	4	28	7
R_2	1	8	19	13	4	5	0	3	0	4	14	4	14	6	31	18
R	0	2	0	46	1	28	0	1	0	7	3	10	1	12	10	10
1R	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	2
2R	0	0	0	8	0	2	0	0	0	0	0	1	0	0	0	2
RR	1	1	59	1	15	–	4	0	2	0	62	–	30	1	60	1
S	–	0	–	–	–	–	–	0	–	0	1	–	1	–	–	0
R_b	–	0	–	–	–	–	–	0	–	0	0	–	–	–	–	0
R_c	–	1	–	–	–	–	–	0	–	0	2	–	–	–	–	0
R_t	–	8	–	–	–	–	–	8	–	2	–	–	–	–	–	1
Total 2	2	54	81	73	21	37	7	19	18	23	96	28	71	28	133	47
Net Depth(m)[a]	152		220		325		180		170		201		200		206	

Table 4 (cont'd)

Gonad maturity stage	Set no. 20 M	20 F	Total M	Total F	% M	% F
I_1	-	-	108	107	10.6	14.0
I_2	-	4	41	43	4.0	5.6
R_1	13	1	161	67	16.0	8.8
R_2	10	4	174	167	17.1	21.8
R	1	9	35	307	3.4	40.0
1R	0	0	0	10	0	1.3
2R	0	0	0	24	0	3.1
RR	33	0	489	10	48.2	1.3
S	-	0	4	0	0.4	0
R_b	-	0	0	0	0	0
R_c	-	0	3	1	0.3	0.1
R_t	-	1	-	31	-	4.0
Total	57	19	1015	767		
Net Depth(m)[a]	183					

[a]Depth of headline rope.

Table 5. Pacific hake - maturity states.

	Female	Male
Immature 1 I-1	Virgin, ovary small, light pink and semi-transparent, no ova.	Virgin, testes small, no convolutions.
Immature 2 I-2	Virgin, ovary still small, light pink and semi-transparent, some ova but without yolk.	Virgin, testes small and pink but convoluted.
Ripening 1 R-1	Ovary small but starting to enlarge, fills about 1/4 body cavity, light yellow ova with yolk and opaque, blood vessels on ovary pronounced.	Testes about 1/4 body cavity and convoluted, contain small amount of milt, convolutions firm and pink.
Ripening 2 R-2	Ovary larger, filling more than 1/3 the body cavity, yellow. Ova with yolk and opaque, blood vessels on ovary pronounced.	Testes about 1/2 body cavity, convoluted, loose and about 2/3 full of milt, edge of convolutions pink and firm.
Ripe R	Ovary translucent yellow - 1/2-2/3 the body cavity, yellow ova opaque or translucent.	Testes large, convoluted and full of milt, fill about 2/3 of body cavity, some milt may flow from vent with pressure.
1 Ripe 1R	Ovary large, fills 1/2-2/3 the body cavity, less than 1/2 the ova are translucent.	No stage in males.
2 Ripe 2R	Ovary large, fills 2/3 the body cavity, more than 1/2 the ova are translucent.	No stage in males.
Running ripe RR	Translucent ova flow from vent with slight pressure, ovaries almost fill body cavity, ova opaque or translucent, ova loose in ovary. Ovary translucent.	Testes large, milt flows from vent with slight pressure, edge of testes may be bloodshot in fresh specimens.
Spent S	Ovary bloodshot, purple in color, some ova may remain translucent. Ovary flaccid about 1/3 body cavity.	Testes bloodshot and flaccid, may contain some milt, now reduced to less than 1/2 body cavity.

Table 5 (cont'd)

	Female	Male
Resorbing Resb. R_b	Fish has not spawned, ovaries large, about 1/2 body cavity and soft and flaccid, ova are large and watery.	No stage in males.
Recovering Rec. R_c	Ovaries returning to pre-ripening size, less than 1/2 body cavity, not flaccid, moderately firm. Ova small, no bloodshot appearance.	Testes moderately firm, little milt and loose convolutions.
Resting Rest. R_t	Ovaries small, less than 1/4 body cavity, moderately firm, bloodshot appearance gone, white sheen to external ovary surface.	Testes small, firm and pink, may be some milt, with convolutions, less than 1/4 body cavity.

Table 6. Pacific hake stomach contents. G.B. REED, March 22-April 2, 1976.

Number examined	1333	
Number empty	602	
Number everted	527	
	Volume (cc)	(%)
Hake (y-of-yr)	97	18.2
Fish remains (unidentified)	71	13.3
Eulachon	69	13.0
Leuroglossus	56	10.5
Herring	41	7.7
Lampfish	9	1.7
Glass shrimp	81	15.2
Euphausiids	64	12.0
Shrimp remains (unidentified)	23	4.3
Pink shrimp	21	3.9
Amphipods	1	0.2
Total	533	

Table 7. Summary of biological samples collected from walleye pollock by set. G.B. REED, March 22-April 2, 1976.

Set no.	Fork lengths			Maturity	Stomach contents	Sampling remarks
	Male	Female	Total			
1	11	3	14	14	14	Total catch
2	94	185	279	279	–	Total catch
3	6	26	32	32	32	Total catch
4	46	31	77	77	77	Total catch
5	21	20	41	41	–	Total catch
6	5	17	22	22	–	Total catch
7	39	96	135	135	135	Total catch
8	136	56	291	104	–	Total catch
9	151	95	246	–	–	Total catch
10	60	7	67	67	67	Total catch
11	0	2	2	2	2	Total catch
12	2	7	9	9	9	Total catch
13	2	1	3	3	3	Total catch
14	22	3	25	25	25	Total catch
15	1	5	6	6	6	Total catch
16	1	0	1	1	1	Total catch
17	0	3	3	3	3	Total catch
18	2	16	18	18	18	Total catch
19	0	12	12	12	12	Total catch
20	34	22	56	56	56	Total catch
Total	633	607	1339	906	460	

Table 8. Walleye pollock maturity stages by set. G.B. REED, March 22-April 2, 1976.

Gonad maturity stage	Set no. 1		2		3		4		5		6	
	M	F	M	F	M	F	M	F	M	F	M	F
I_1	-	-	7	6	1	-	1	-	-	-	-	-
I_2	-	-	4	20	0	1	0	4	1	-	-	-
R_1	-	-	4	0	0	0	0	0	0	-	-	-
R_2	-	-	3	44	0	4	0	0	0	1	-	1
R	3	-	3	4	0	5	0	10	0	2	-	0
1R	0	2	0	30	0	4	0	3	0	4	-	0
2R	0	0	0	32	0	2	0	8	0	5	-	2
RR	2	0	43	23	3	2	31	3	7	2	3	1
S	6	1	4	6	0	2	10	2	1	1	0	3
R_c	-	-	24	16	2	4	4	1	9	4	2	5
R_t	-	-	2	4	-	2	-	-	3	1	-	5
Total	11	3	94	185	6	26	46	31	21	20	5	17
Net Depth(m)[a]	256		216		198		220		200		217	

Gonad maturity stage	Set no. 7		8		10		11		12		13	
	M	F	M	F	M	F	M	F	M	F	M	F
I_1	-	-	-	-	1	-	-	-	1	1	-	-
I_2	2	1	-	-	0	2	-	-	0	1	-	-
R_1	1	0	1	-	0	0	-	-	0	0	-	-
R_2	0	2	2	-	2	0	-	-	0	0	-	-
R	0	30	0	4	0	1	-	1	0	2	-	-
1R	0	10	0	0	0	0	-	0	0	0	-	1
2R	0	9	0	5	0	1	-	0	0	0	-	-
RR	1	4	50	6	47	0	-	1	1	0	2	-
S	4	16	6	6	1	0	-	-	-	0	-	-
R_c	29	10	17	3	9	2	-	-	-	3	-	-
R_t	1	15	-	4	-	1	-	-	-	-	-	-
Total	38	97	76	28	60	7	-	2	2	7	2	1
Net Depth(m)[a]	132		165		293		201		152		220	

Table 8 (cont'd)

Gonad maturity stage	Set no. 14 M	14 F	15 M	15 F	16 M	16 F	17 M	17 F	18 M	18 F	19 M	19 F
I_1	–	–	–	–	–	–	–	–	–	–	–	–
I_2	–	–	–	–	–	–	–	–	–	1	–	2
R_1	–	–	–	–	–	–	–	–	–	0	–	0
R_2	3	–	–	1	–	–	–	–	–	0	–	0
R	0	–	–	1	–	–	–	–	–	1	–	4
1R	0	1	–	0	–	–	–	–	–	0	–	3
2R	0	2	–	1	–	–	–	–	–	0	–	0
RR	15	–	1	0	–	–	–	–	–	0	–	2
S	0	–	–	0	–	–	–	–	–	0	–	0
R_c	4	–	–	2	1	–	–	3	2	10	–	1
R_t	–	–	–	–	–	–	–	–	–	4	–	–
Total	22	3	1	5	1	–	–	3	2	16	–	12
Net Depth(m)[a]	325		180		170		201		200		206	

Gonad maturity stage	Set no. 20 M	20 F	Total M	Total F	% M	% F
I_1	1	–	12	7	3	2
I_2	0	3	7	35	2	7
R_1	0	0	6	0	1	0
R_2	0	0	10	53	2	11
R	4	7	10	72	2	15
1R	0	2	0	60	0	12
2R	0	3	0	70	0	14
RR	11	0	217	44	52	9
S	4	6	36	43	9	9
R_c	14	1	117	65	28	13
R_t	–	–	6	36	1	8
Total	34	22	421	485		
Net Depth(m)[a]	183					

[a]Depth of headline rope

Table 9. Walleye pollock maturity stages by sex.

	Female	Male
Immature 1 I-1	Virgin, no ova, ovary small and semi-transparent.	Virgin, testes small, transparent, no convolutions or few and small convolutions.
Immature 2 I-2	Virgin, some ova but scattered in ovary, ovary semi-transparent and small, ova opaque.	Virgin, testes small and convoluted.
Ripening 1 R-1	Ovary starting to enlarge, fills about 1/4 body cavity, ova opaque, blood vessels pronounced.	Testes beginning to enlarge fill about 1/4 body cavity, convoluted, firm and beginning to contain milt.
Ripening 2 R-2	Ovary large, fills 1/3-1/2 body cavity, blood vessels pronounced, ova opaque.	Testes large, fill about 1/3 body cavity, extremely convoluted, contain milt.
Ripe R	Ovary large, fills 1/2-2/3 body cavity.	Testes extremely convoluted, filled with free flowing milt, testes large, fill 1/2-2/3 body cavity.
Running Ripe RR	Ovaries very large, ova flow from vent with slight pressure.	Testes very large, milt flows from vent with slight pressure.
Spent S	Ovary bloodshot, purple in colour, some ova may remain, ovary flaccid.	Testes bloodshot, may contain milt.
Resorbing Resb. R_s	Ovaries large, watery; ova large, soft and flaccid	No stage in males.
Recovering Rec. R_c	Ovaries returning to pre-ripening size moderately firm, white sheen to external ovary.	Testes small moderately firm, some milt and losing convolutions.
Resting Rest. R_t	Ovaries small and semi-transparent, ova opaque.	Testes small, firm, little milt and convoluted.

Table 10. Walleye pollock stomach contents. G.B. REED, March 22-April 2,1976.

Number examined	460	
Number empty	319	
Number everted	12	
	Volume (cc)	(%)
Fish remains (unidentified)	47	11.7
Eulachon	45	11.2
Leuroglossus	28	7.0
Hake (y-of-yr)	12	3.0
Eggs (unidentified)	2	0.5
Amphipods	107	26.8
Euphausiids	98	24.5
Glass shrimp	26	6.5
Digested matter (unidentified)	19	4.8
Copepod	8	2.0
Ctenophores	4	1.0
Plankton (unidentified)	4	1.0
Total	400	

Table 11. Summary of spiny dogfish sampled. G.B. REED, March 22-April 2, 1976.

Set no.	Total length			Maturity	Stomach contents	Spines	Wt[a]	Sampling remarks
	Male	Female	Total					
1	-	6	6	6	6	-	-	Total catch
2	9	12	21	21	21	-	21	Total catch
3	39	6	45	45	45	-	3	Total catch
4	32	36	68	68	68	-	68	Total catch
5	-	-	-	-	-	-	-	Not sampled
6	-	-	-	-	-	-	-	Not sampled
7	6	6	12	12	12	-	12	Total catch
8	36	12	48	48	48	-	-	Total catch
9	6	15	21	21	21	-	-	Total catch
10	15	12	27	27	27	-	27	Total catch
11	25	10	35	35	35	-	35	Total catch
12	145	65	210	210	210	-	142	Total catch
13	13	8	21	21	21	-	21	Total catch
14	1	1	2	2	2	-	2	Total catch, wt for <70cm
15	38	29	67	67	67	67	66	Total catch
16	62	29	91	90	91	91	91	Total catch
17	17	3	20	20	20	20	20	Total catch
18	4	6	10	9	10	10	10	Total catch
19	2	9	11	11	11	11	11	Total catch
20	3	3	6	6	6	6	6	Total catch
Total	453	268	721	719	721	205	535	

[a]Body weight in the round.

Table 12. Mean length of spiny dogfish for each age class for sets 15-20. G.B. REED, March 22-April 2, 1976.

Age class	Frequency	Range (mm)	Mean length (mm)
1	2	315-388	352
2	2	377-396	387
3	15	353-441	398
4	18	392-454	424
5	23	376-494	427
6	13	412-486	440
7	19	410-500	454
8	17	441-526	482
9	10	420-603	476
10	5	444-574	517
11	4	450-556	502
12	3	432-495	460
13	5	445-630	549
14	8	525-798	620
15	3	514-664	556
16	2	570-798	684
17	2	541-593	567
18	3	530-682	595
19	3	630-830	704
20	1		618
21	2	665-818	742
22	3	615-847	718
23	5	613-857	672
24	2	581-803	692
25	2	631-683	657
26	3	660-788	711
27	4	721-862	776
28	1		836
29	2	676-914	795
30	1		898
31	3	737-871	815
32	6	600-924	768
33	1		848
34	1		810
35	0		
36	1		908
42	1		733
43	2	886-1054	970
46	1		1064
52	1		1244
Total	200		

Table 13. Mean lengths of male spiny dogfish for each age class for sets 15-20, G.B. REED, March 22-April 2, 1976.

Age class	Frequency	Range (mm)	Mean length (mm)
1	1		388
2	1		396
3	8	353-441	398
4	10	392-434	421
5	16	376-459	426
6	7	425-463	443
7	16	410-500	456
8	8	441-504	467
9	5	425-531	473
10	3	468-572	523
11	1		482
12	2	455-495	495
13	3	445-561	521
14	6	525-798	624
15	1		491
16	2	570-798	684
17	1		593
18	1		530
19	3	630-830	704
20	0		
21	2	665-818	742
22	2	693-847	770
23	4	613-857	725
24	2	581-803	692
25	1		683
26	0		
27	3	758-862	793
28	1		836
29	1		676
30	1		898
31	1		838
32	4	600-924	762
33	1		848
34	1		810
42	1		733
43	1		886
Total	121		

Table 14. Mean length of female spiny dogfish for each age class for sets 15-20. G.B. REED, March 22-April 2, 1976.

Age class	Frequency	Range (mm)	Mean length (mm)
1	1		315
2	1		377
3	7	375-437	398
4	8	404-454	428
5	7	391-494	431
6	6	412-486	436
7	3	427-459	448
8	9	467-526	496
9	5	420-603	479
10	2	444-574	509
11	3	450-556	509
12	1		432
13	2	549-630	590
14	2	562-652	607
15	2	514-664	589
16	0		
17	1		541
18	2	573-682	628
19	0		
20	1		618
21	0		
22	1		615
23	1		731
24	0		
25	1		631
26	3	660-788	711
27	1		721
28	0		
29	1		914
30	0		
31	2	737-871	804
32	2	765-793	779
33	0		
34	0		
35	0		
36	1		908
43	1		1054
46	1		1064
52	1		1244
Total	79		

Table 15. Spiny dogfish maturity stages by set. G.B. REED, March 22-April 2, 1976.

Gonad maturity stage	Set no. 1		2		3		4		7		8	
	M	F	M	F	M	F	M	F	M	F	M	F
I_1	–	–	9	–	12	–	24	–	1	–	4	–
I_2	–	–	–	–	1	–	1	–	0	–	1	–
R	–	–	–	–	26	–	7	–	5	–	31	–
I_1D_1	–	–	–	1	–	–	–	–	–	–	–	–
I_2D_1	–	–	–	6	–	4	–	30	–	6	–	8
I_2D_2	–	–	–	0	–	0	–	0	–	–	–	0
R_1D_2	–	1	–	3	–	1	–	0	–	–	–	1
R_1D_3	–	2	–	1	–	0	–	0	–	–	–	0
R_1D_5	–	0	–	1	–	1	–	2	–	–	–	0
R_2D_3	–	1	–	–	–	–	–	1	–	–	–	2
R_2D_4	–	0	–	–	–	–	–	1	–	–	–	0
R_3D_4	–	1	–	–	–	–	–	1	–	–	–	0
R_3D_5	–	1	–	–	–	–	–	0	–	–	–	1
R_3D_6	–	–	–	–	–	–	–	1	–	–	–	–
R_3D_8	–	–	–	–	–	–	–	–	–	–	–	–
Total	–	6	9	12	39	6	32	36	6	6	36	12
Net Depth(m)[a]	256		216		198		220		132		165	

Gonad maturity stage	Set no. 9		10		11		12		13		14	
	M	F	M	F	M	F	M	F	M	F	M	F
I_1	2	–	9	–	25	–	75	–	10	–	–	–
I_2	1	–	0	–	–	–	3	–	1	–	–	–
R	3	–	6	–	–	–	67	–	2	–	1	–
I_1D_1	–	–	–	–	–	–	–	–	–	–	–	–
I_2D_1	–	–	–	11	–	10	–	65	–	6	–	1
I_2D_2	–	6	–	0	–	–	–	–	–	0	–	–
R_1D_2	–	4	–	1	–	–	–	–	–	0	–	–
R_1D_3	–	1	–	1	–	–	–	–	–	0	–	–
R_1D_5	–	0	–	–	–	–	–	–	–	2	–	–
R_2D_3	–	0	–	–	–	–	–	–	–	–	–	–
R_2D_4	–	1	–	–	–	–	–	–	–	–	–	–
R_3D_4	–	1	–	–	–	–	–	–	–	–	–	–
R_3D_5	–	0	–	–	–	–	–	–	–	–	–	–
R_3D_6	–	1	–	–	–	–	–	–	–	–	–	–
R_3D_8	–	1	–	–	–	–	–	–	–	–	–	–
Total	6	15	15	12	25	10	145	65	13	8	1	1
Net Depth(m)[a]	201		293		201		152		220		325	

Table 15 (cont'd)

Gonad maturity stage	Set no. 15 M	15 F	16 M	16 F	17 M	17 F	18 M	18 F	19 M	19 F	20 M	20 F
I_1	27	-	53	-	14	-	2	-	1	-	1	-
I_2	1	-	0	-	0	-	1	-	0	-	0	-
R	0	-	9	-	3	-	-	-	1	-	2	-
I_1D_1	-	-	-	-	-	-	-	-	-	-	-	-
I_2D_1	-	28	-	28	-	3	-	3	-	8	-	2
I_2D_2	-	0	-	-	-	-	-	0	-	0	-	0
R_1D_2	-	0	-	-	-	-	-	1	-	1	-	0
R_1D_3	-	0	-	-	-	-	-	0	-	-	-	0
R_1D_5	-	0	-	-	-	-	-	2	-	-	-	0
R_2D_3	-	0	-	-	-	-	-	-	-	-	-	0
R_2D_4	-	0	-	-	-	-	-	-	-	-	-	0
R_3D_4	-	0	-	-	-	-	-	-	-	-	-	0
R_3D_5	-	0	-	-	-	-	-	-	-	-	-	0
R_3D_6	-	1	-	-	-	-	-	-	-	-	-	1
R_3D_8	-	-	-	-	-	-	-	-	-	-	-	-
Total	38	29	62	28	17	3	3	6	2	9	3	3
Net Depth(m)[a]	180		170		201		200		206		183	

Gonad maturity stage	Set no. Total M	Total F	(%) M	(%) F
I_1	269	-	59.5	-
I_2	10	-	2.2	-
R	173	-	38.3	-
I_1D_1	-	1	-	0.4
I_2D_1	-	219	-	82.0
I_2D_2	-	6	-	2.2
R_1D_2	-	13	-	4.9
R_1D_3	-	4	-	1.5
R_1D_5	-	8	-	3.0
R_2D_3	-	4	-	1.5
R_2D_4	-	2	-	0.7
R_3D_4	-	3	-	1.1
R_3D_5	-	2	-	0.7
R_3D_6	-	4	-	1.5
R_3D_8	-	1	-	0.4
Total	452	267		
Net Depth(m)[a]				

[a]Depth of headline rope.

Table 16. Spiny dogfish maturity stages[a] by sex.

Female			
Ovaries		Uterus	
I_1	No ova.	D_1	Thin, no thickening.
I_2	Ova small, 0-5 mm white, firm ovary <1/4 length of body cavity.	D_2	Thin <5 mm, thickened sectioned <1/4 length of body cavity.
R_1	Ova 5-10 mm white, firm, ovary flaccid flocculent external surface.	D_3	About 5 mm thickened sectioned; <1/4 length of body cavity.
R_2	Ova 10-30 mm yellow; ovary flaccid.	D_4	About 10 mm or wider thickened section, flaccid; >1/3 length of body cavity.
R_3	Ova are two sizes: white, firm <20 mm and yellow, firm >20 mm; ovary flaccid 1/4 to 1/3 length of body cavity.	D_5	Uterine eggs.
		D_6	Yolk sac, pups.
		D_7	Term pup.
Resting	Ova small, white, firm <10 mm; ovary flaccid, fibrous exterior granular texture.	D_8	Flaccid.
Males			
I_1	Claspers do not extend past tips of anal fins; testes flat, creamy.		
I_2	Claspers extend past tips of anal fins; testes creamy colour, not brown or bloodshot.		
R	Claspers extend past tips of anal fins; stiff, testes creamy brown, bloodshot, very firm.		

[a]The codes: I = immature.
R = ripening, ripe.
D = developing.

Table 17. Spiny dogfish stomach contents. G.B. REED, March 22-April 2, 1976.

	Dogfish ≤60 cm (total length)	Dogfish >60 cm (total length)	Total
Number examined	445	276	721
Number empty	226	106	332
	Volume (cc)	Volume (cc)	Total
Hake	3	4202	4205
Herring	4	3135	3139
Pollock	-	895	895
Lamprey	-	200	200
Eulachon	-	175	175
Midshipman	-	160	160
Dover sole	-	150	150
Ratfish	-	100	100
California lampfish	10	32	42
Leuroglossus	21	30	51
Fish remains (unidentified)	83	758	841
Squid	12	1030	1042
Crab	-	50	50
Pink shrimp	-	10	10
Euphausiids	48	5	53
Glass shrimp	1	3	4
Amphipods	22	1	23
Digested matter	35	155	190
Plankton	7	-	7
Polycheate	33	-	33
Ctenophores	9	-	9
Jellyfish	2	-	2

Table 18. Summary of species sampled other than hake, pollock and dogfish. G.B. REED, March 22-April 2, 1976.

Species	Set no.	Length	Sex	Maturity	Stomach contents	Sample type
Brown cat shark	4	1	1	1	1	Total catch
	5	2	?	-	-	Total catch
	8	1	1	-	-	Total catch
	10	2	2	2	2	Total catch
	17	1	1	1	1	Total catch
	19	4	4	4	4	Total catch
	20	5	5	-	-	Total catch
Chinook salmon	9	1	1	1	-	Total catch
Eulachon	7	171	-	-	-	Total catch
Pacific cod	11	1	1	1	-	Total catch
	12	1	1	1	-	Total catch
Splitnose rockfish	12	5	5	-	-	Total catch

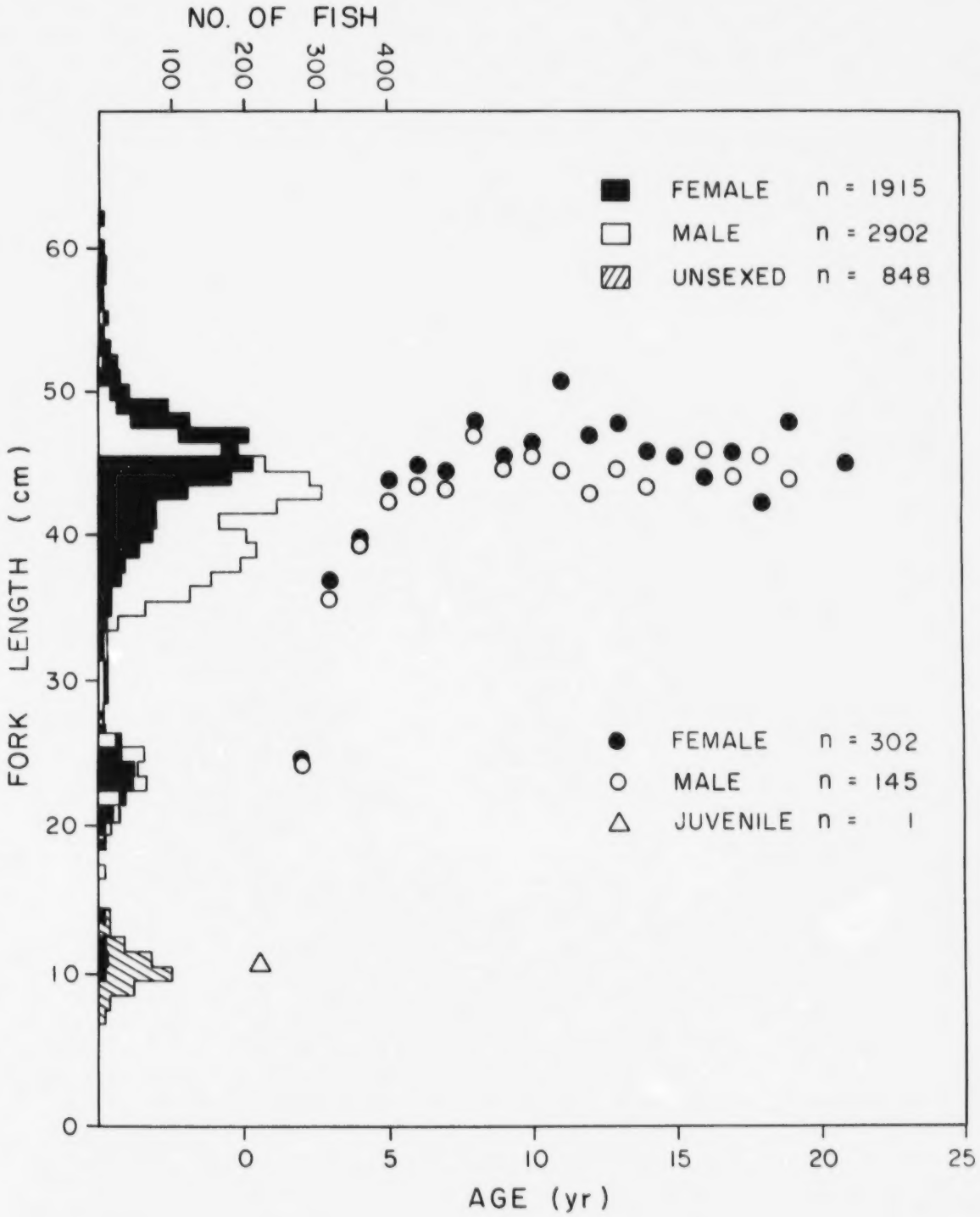


Fig. 1. Pacific hake length frequency and mean length at age plots by sex. G.B. REED, March 22 - April 2, 1976.

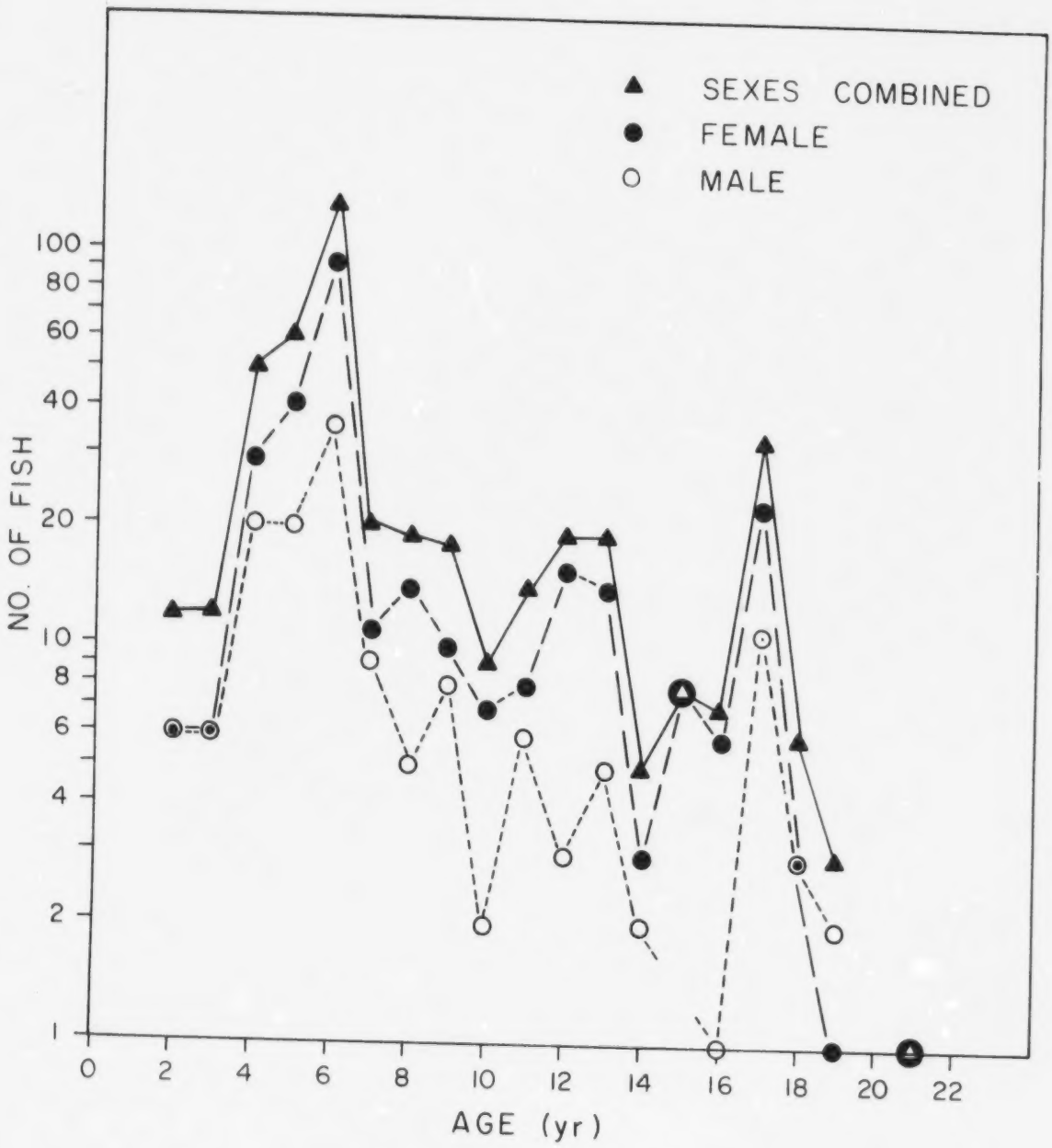


Fig. 2. Pacific hake "catch curves" by sex for set 4. G.B. REED, March 22 - April 2, 1976.

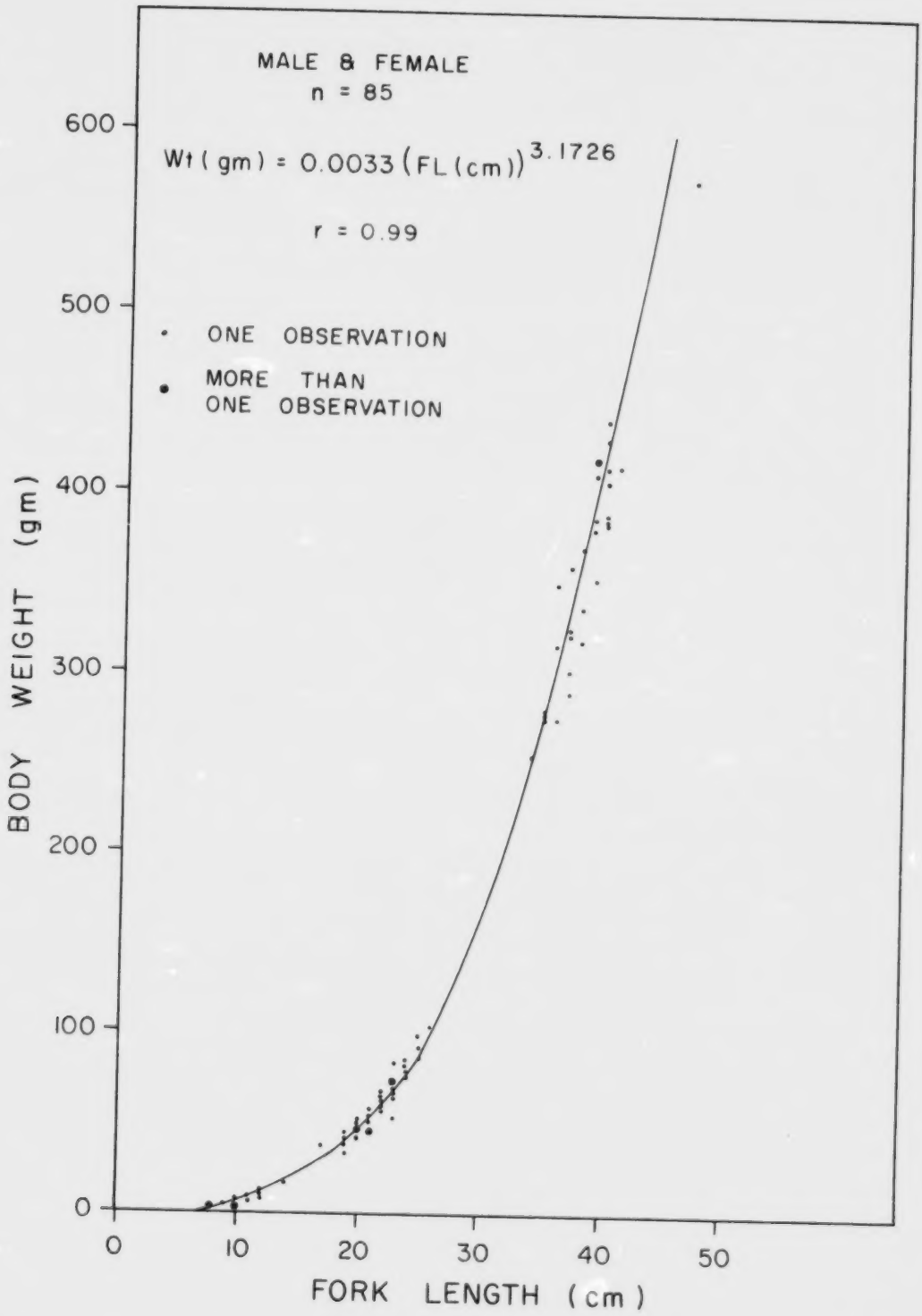


Fig. 3. Pacific hake length-weight relationship for sexes combined. G.B. REED, March 22 - April 2, 1976.

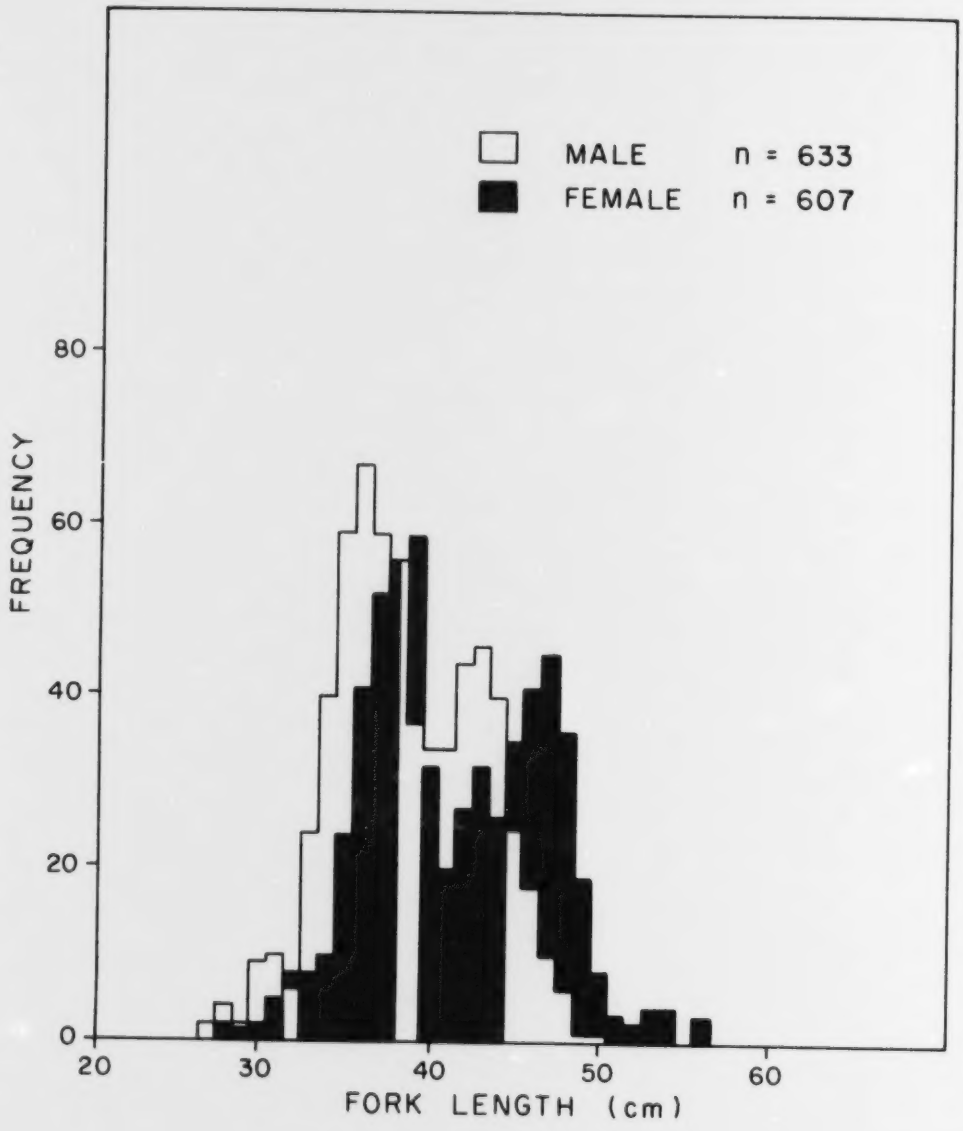
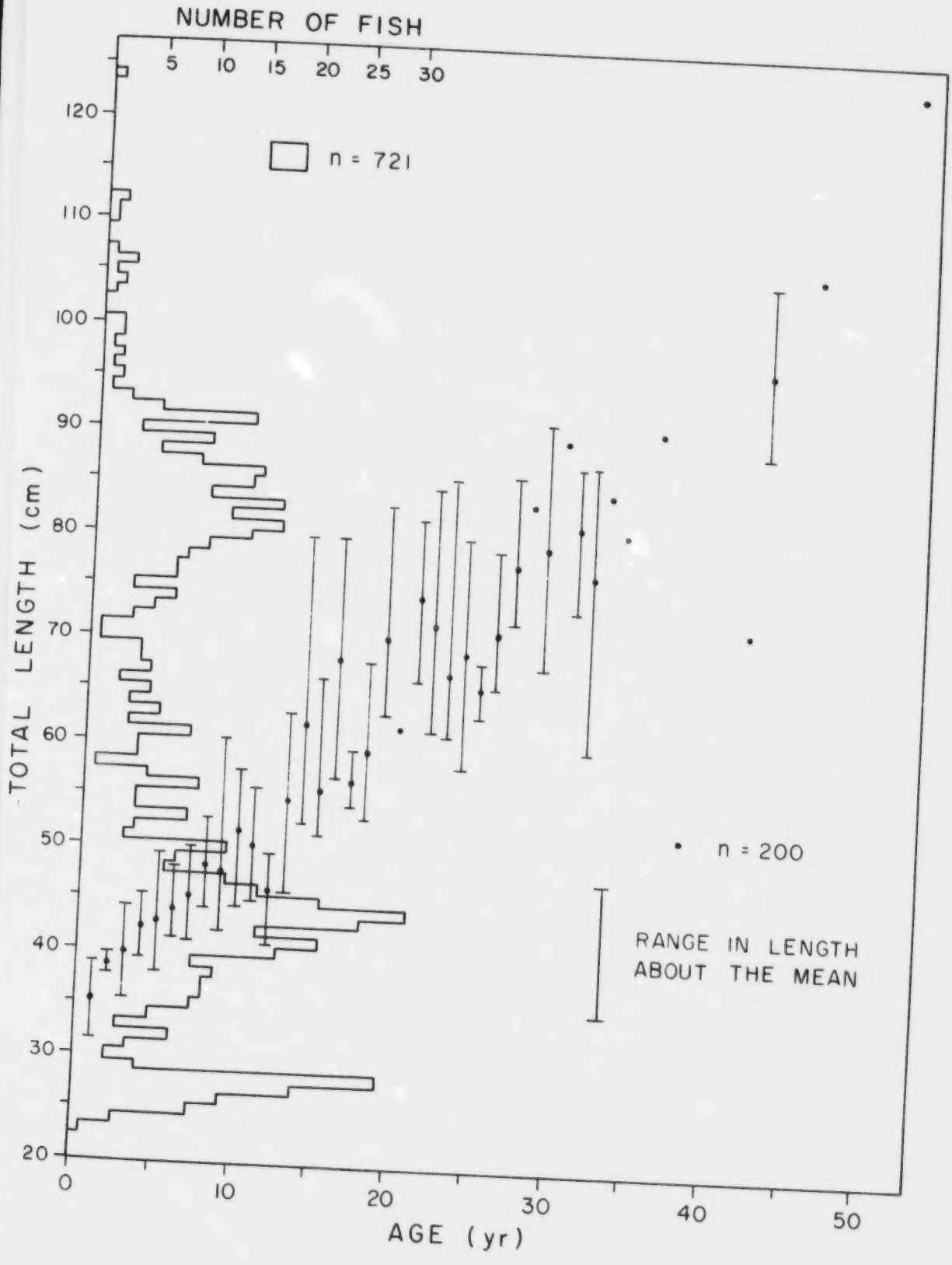


Fig. 4. Walleye pollock length frequency by sex.
G.B. REED, March 22 - April 2, 1976.

Fig. 5. Spiny dogfish length frequency and mean length at age plots for sexes combined. G.B. REED, March 22 - April 2, 1976.


NUMBER OF FISH
5
10
15
20
25
30
n = 721
120
110
100
90
80
70
60
50
40
30
20
TOTAL LENGTH (cm)
n = 200
RANGE IN LENGTH
ABOUT THE MEAN
0
10
20
30
40
50
AGE (yr)

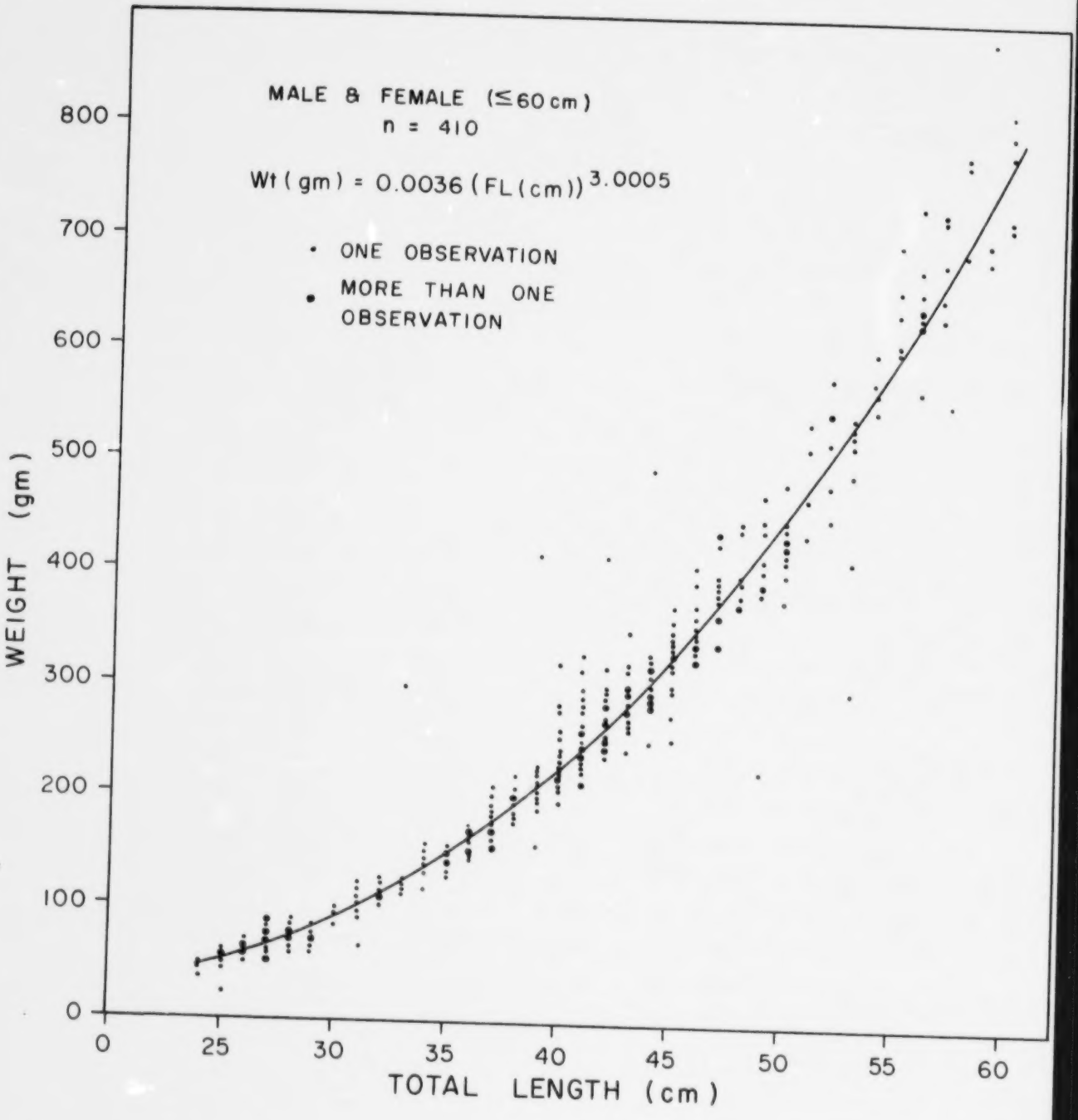


Fig. 6. Length-weight relationship for spiny dogfish ≤ 60 cm for sexes combined. G.B. REED, March 22 - April 2, 1976.

APPENDIX TABLE 1. Set information, G.B. REED, March 22-April 2, 1976.

VESSEL: G.B. REED DATE: Yr 76 Mo Mar. Day 23 SET/HAUL NO: 1

LOCATION: Merry Is. AREA: Strait of Georgia

START: Lat. 49° 24.7'N Long. 123 ° 55.9'W

END: Lat. 49° 24.0'N Long. 123° 53.8'W

GEAR: Engel 434 MWT (1.9 cm) START TIME (PST) : 0830 DURATION: 30 min.

BOTTOM DEPTH m: Start: 296 End: 300 Est. Av. Depth: 298

NET DEPTH RANGE m: 270-244 Est. Av. Depth: 256 m

DIRECTION OF SET °true: 115 SPEED kn: 2.5 DISTANCE TRAVELLED: 2.0 mi.

SET ON: homogenous layer WATER CONDITION: choppy TIDE:

WIND DIRECTION: SE WIND SPEED: 25 RECORDER: MSS

TTM: TDM: BT: No. 1 OTHER OCEANOGRAPHIC DATA:

REMARKS: Net opening 14.6

SOUNDER SUMMARY: Light images of individual targets above 146 m.
Homogenous layer 256 m.
Net fouled. All catch in forward wing.

VESSEL: G.B.REED DATE: Yr 76 Mo Mar. Day 23 SET/HAUL NO: 2

LOCATION: Merry Island AREA: Strait of Georgia

START: Lat. 49° 25.4'N Long. 123° 56.1'W

END: Lat. 49° 24.3'N Long. 123° 54.3'W

GEAR: Engel 434 MWT START TIME (PST): 1256 DURATION: 30 min.

BOTTOM DEPTH m: Start: 238 End: 286 Est. Av. Depth: 262

NET DEPTH RANGE m: 164-225 Est. Av. Depth: 216

DIRECTION OF SET °true: 115 SPEED kn: 3 DISTANCE TRAVELLED: mi.

SET ON: 165 m-238 m WATER CONDITION: Heavy chop TIDE:

WIND DIRECTION: SE WIND SPEED: 40 RECORDER: MSS

TTM: TDM: BT: 2 OTHER OCEANOGRAPHIC DATA:

REMARKS: Net open 13.7: Warp 549 m

SOUNDER SUMMARY:

Light layer of fish 165 m to bottom.

Appendix Table 1 (cont'd)

VESSEL: G.B. REED DATE: Yr 76 Mo Mar. Day 23 SET/HAUL NO: 3

LOCATION: Entrance Island AREA: Strait of Georgia

START: Lat. 49° 16.1' N Long. 123° 50.8' W

END: Lat. 49° 17.6' N Long. 123° 50.0' W

GEAR: Engel 434 MWT START TIME (PST): 1529 DURATION: 30 min.

BOTTOM DEPTH m: Start: 414 End: 410 Est. Av. Depth: 408

NET DEPTH RANGE m: 196-200 Est. Av. Depth: 198

DIRECTION OF SET °true: 034 SPEED kn: 3 DISTANCE TRAVELLED: 1.6 mi.

SET ON: 179-209 m WATER CONDITION: Heavy chop TIDE:

WIND DIRECTION: SE WIND SPEED: 40 RECORDER: MSS

TTM: TDM: BT: 3 OTHER OCEANOGRAPHIC DATA:

REMARKS: Standard set: Net open 13.7 m: Warp 549 m.

SOUNDER SUMMARY: layer of fish 179 m to 209 m.

VESSEL: G.B. REED DATE: Yr 76 Mo Mar. Day 25 SET/HAUL NO: 4

LOCATION: Cape Roger Curtis AREA: Strait of Georgia

START: Lat. 49° 16.0'N Long. 123° 30.4'W

END: Lat. 49° 14.75'N Long. 123° 31.4'W

GEAR: Engel 434 MWT START TIME (PST): 0949 DURATION: 30 min.

BOTTOM DEPTH m: Start: 318 End: 344 Est. Av. Depth: 331

NET DEPTH RANGE m: 103 m Est. Av. Depth: 220

DIRECTION OF SET °true: 208 SPEED kn: 3 DISTANCE TRAVELLED: - mi.

SET ON: target - 220 m WATER CONDITION: ripple TIDE: -

WIND DIRECTION: SE WIND SPEED: 12 RECORDER: MSS

TTM: TDM: BT: OTHER OCEANOGRAPHIC DATA:

REMARKS: Net opening 14.6 m: warp length 549 m

SOUNDER SUMMARY: Medium dense homogenous layer 165-185 m to bottom.
Target slightly more, dense mass--not particularly layered.

Appendix Table 1 (cont'd)

VESSEL: G.B. REED DATE: Yr 76 Mo March Day 25 SET/HAUL NO: 5

LOCATION: North Arm Jetty AREA: Strait of Georgia

START: Lat. 49° 16.1'N Long. 123° 23.9'W

END: Lat. 49° 17.0'N Long. 123° 22.4'W

GEAR: Engel 434 MWT START TIME (PST): 1217 DURATION: 30 min.

BOTTOM DEPTH m: Start: 223 End: 251 Est. Av. Depth: 237

NET DEPTH RANGE m: 186-214 Est. Av. Depth: 200

DIRECTION OF SET °true: 045 SPEED kn: 2.5 DISTANCE TRAVELLED 1.4 mi.

SET ON: WATER CONDITION: ripple TIDE:

WIND DIRECTION: S WIND SPEED: 10 RECORDER: MSS

TTM: TDM: BT: 5 OTHER OCEANOGRAPHIC DATA:

REMARKS: Standard set: net open 13.7 m: Warp 503

SOUNDER SUMMARY: Light scatter, individual targets 128 m to bottom

---

VESSEL: G.B. REED DATE: Yr 76 Mo March Day 25 SET/HAUL NO: 6

LOCATION: Entrance Is. AREA: Strait of Georgia

START: Lat. 49° 15.15'N Long. 123 ° 57.4'W

END: Lat. 49° 13.85'N Long. 123 ° 45.6'W

GEAR: Engel 434 MWT START TIME (PST): 1523 DURATION: 30 min.

BOTTOM DEPTH m: Start: 410 End: 337 Est. Av. Depth: 374

NET DEPTH RANGE m: 234-200 Est. Av. Depth: 217

DIRECTION OF SET °true: 120 SPEED kn: 2.5 DISTANCE TRAVELLED: - mi.

SET ON: 210 m WATER CONDITION: ripple TIDE:

WIND DIRECTION: SE WIND SPEED: 10 RECORDER: MSS

TTM: TDM: BT: 6 OTHER OCEANOGRAPHIC DATA:

REMARKS: Net open 14.6 m: Warp 641

SOUNDER SUMMARY: Heavy layer 165-250 m.

Appendix Table 1 (cont'd)

VESSEL: G.B. REED DATE: Yr 76 Mo Mar. Day 26 SET/HAUL NO: 7

LOCATION: Active Pass AREA: Strait of Georgia

START: Lat. 48° 54.35' N Long. 123° 13.6' W

END: Lat. 48° 55.7 ' N Long. 123° 11.6' W

GEAR: Engel 434 MWT START TIME (PST) : 0850 DURATION: 30 min.

BOTTOM DEPTH m: Start: 143 End: 135 Est. Av. Depth: 139

NET DEPTH RANGE m: 138-130 Est. Av. Depth: 132

DIRECTION OF SET °true: 045 SPEED kn: 2.5-4.0 DISTANCE TRAVELLED: 1.9 mi.

SET ON: _____ WATER CONDITION: light chop TIDE: _____

WIND DIRECTION: S WIND SPEED: 20 RECORDER: MSS

TTM: _____ TDM: _____ BT: 7 OTHER OCEANOGRAPHIC DATA: _____

REMARKS: net open 14.6 m: warp 411 m

SOUNDER SUMMARY: Small single target. Very light density ≈130 m.

VESSEL: G.B. REED DATE: Yr 76 Mo Mar. Day 26 SET/HAUL NO: 8

LOCATION: Salamanca Point AREA: Strait of Georgia

START: Lat. 48° 59.3 'N Long. 123° 20.4' W

END: Lat. 49° 0.3 'N Long. 123° 18.8' W

GEAR: Engel 434 MWT START TIME (PST): 1042 DURATION: 30 min.

BOTTOM DEPTH m: Start: 216 End: 194 Est. Av. Depth: 205

NET DEPTH RANGE m: 176-154 Est. Av. Depth: 165

DIRECTION OF SET °true: 055 SPEED kn: 2 DISTANCE TRAVELLED: 1.4 mi.

SET ON: _____ WATER CONDITION: light chop TIDE: _____

WIND DIRECTION: S WIND SPEED: 20 RECORDER: MSS

TTM: _____ TDM: _____ BT: 8 OTHER OCEANOGRAPHIC DATA: _____

REMARKS: Standard Set: Net opening 13.7 m: Warp 458 m.

SOUNDER SUMMARY:

Appendix Table 1 (cont'd)

VESSEL: G.B. REED DATE: Yr 76 Mo Mar. Day 26 SET/HAUL NO: 9

LOCATION: Detwiller Point AREA: Strait of Georgia

START: Lat. 49° 5.3'N Long. 123° 29.5' W

END: Lat. 49° 6.4'N Long. 123° 27.2' W

GEAR: Engel 434 MWT START TIME (PST): 1242 DURATION: 30 min.

BOTTOM DEPTH m: Start: 340 End: 311 Est. Av. Depth: 326

NET DEPTH RANGE m: 203-174 Est. Av. Depth: 201

DIRECTION OF SET °true: 065 SPEED kn: 2 DISTANCE TRAVELLED: 1.4 mi.

SET ON: _____ WATER CONDITION: Chop TIDE: _____

WIND DIRECTION: S WIND SPEED: 25 RECORDER: MSS

TTM: _____ TDM: _____ BT: 9 OTHER OCEANOGRAPHIC DATA: _____

REMARKS: Standard Set: net open 13.7 m: warp 549

SOUNDER SUMMARY: Layer 180-275 m, heavy density.

VESSEL: G.B. REED DATE: Yr 76 Mo Mar. Day 30 SET/HAUL NO: 10

LOCATION: Sisters Is. AREA: Strait of Georgia

START: Lat. 49° 26.3'N Long. 124° 26.4' W

END: Lat. 49° 25.2'N Long. 124° 24.6' W

GEAR: Engel 434 MWT START TIME (PST): 0819 DURATION: 30 min.

BOTTOM DEPTH m: Start: 333 End: 344 Est. Av. Depth: 338

NET DEPTH RANGE m: 293 Est. Av. Depth: 293

DIRECTION OF SET °true: 132 SPEED kn: 2.5-3.5 DISTANCE TRAVELLED: 1.6 mi.

SET ON: Target 289-304 m WATER CONDITION: Heavy chop TIDE: -

WIND DIRECTION: SE WIND SPEED: 30 RECORDER: MSS & AC

TTM: _____ TDM: _____ BT: 10 OTHER OCEANOGRAPHIC DATA: _____

REMARKS: Net opening 12.8: warp length 778

SOUNDER SUMMARY: Light layer 295 m, some individual targets above.

Appendix Table 1 (cont'd)

VESSEL: G.B. REED DATE: Yr 76 Mo Mar. Day 30 SET/HAUL NO: 11

LOCATION: Fegan Is. AREA: Strait of Georgia

START: Lat. 49° 34.1 'N Long. 124 ° 22.0 ' W

END: Lat. 49° 33.0' N Long. 124 ° 20.06 ' W

GEAR: Engel 434 MWT START TIME (PST) : 1034 DURATION: 30 min.

BOTTOM DEPTH m: Start: 340 End: 326 Est. Av. Depth: 333

NET DEPTH RANGE m: 131 m off bottom Est. Av. Depth: 132

DIRECTION OF SET °true: 120-136 SPEED kn: 2.5-3.25 DISTANCE TRAVELLED: 1.7 mi.

SET ON: 201 m WATER CONDITION: heavy chop TIDE:

WIND DIRECTION: SE WIND SPEED: 30 RECORDER: MSS & AC

TTM: TDM: BT: 11 OTHER OCEANOGRAPHIC DATA:

REMARKS: Net opening 15.6 m; warp length 549 m

SOUNDER SUMMARY: Fuzz type layer 146-183 m. Single fish layer light density 183 m-256 m. Scattered individual fish to bottom.

VESSEL: G.B. REED DATE: Yr 76 Mo Mar. Day 30 SET/HAUL NO: 12

LOCATION: Shields Point/Hornby Is. AREA: Strait of Georgia

START: Lat. 49° 35.75'N Long. 124 ° 39.0'W

END: Lat. 49° 34.08'N Long. 124 ° 37.02'W

GEAR: Engel 434 MWT START TIME (PST): 1249 DURATION: 31 min.

BOTTOM DEPTH m: Start: 161 End: 135 Est. Av. Depth: 148

NET DEPTH RANGE m: - Est. Av. Depth: 152

DIRECTION OF SET °true: 120 SPEED kn: - DISTANCE TRAVELLED: 1.4 mi.

SET ON: 143-161 m WATER CONDITION: light swell heavy chop TIDE: -

WIND DIRECTION: S WIND SPEED: 20 RECORDER: MSS

TTM: TDM: BT: 12 OTHER OCEANOGRAPHIC DATA:

REMARKS: Net opening 14.6 m: warp length 457 m.

SOUNDER SUMMARY: 18 m soft fuzz laver on bottom with some single fish in layer above.

Appendix Table 1 (cont'd)

VESSEL: G. B. REED DATE: Yr 76 Mo Mar. Day 30 SET/HAUL NO: 13

LOCATION: Flavada Point (Texada) AREA: Strait of Georgia

START: Lat. 49° 44.35' N Long. 124 ° 41.7 ' W

END: Lat. 49 ° 43.37 N Long. 124 ° 39.95' W

GEAR: Engel 434 MWT START TIME (PST) : 1455 DURATION: 30 min.

BOTTOM DEPTH m: Start: 358 End: 355 Est. Av. Depth: 356

NET DEPTH RANGE m: 125.3 m Est. Av. Depth: 220

DIRECTION OF SET °true: 126 SPEED kn: 2.5 DISTANCE TRAVELLED: 1.6 mi.

SET ON: 220 m WATER CONDITION: light chop TIDE: -

WIND DIRECTION: S WIND SPEED: 20 RECORDER: MSS

TTM: _____ TDM: _____ BT: none OTHER OCEANOGRAPHIC DATA: _____

REMARKS: Net opening 13.7 m. Warp length 641 m.

SOUNDER SUMMARY: First layer of medium density 190-256 m.
Second layer 318-333 m of medium density.

VESSEL: G.B. REED DATE: Yr 76 Mo Day SET/HAUL NO: 14

LOCATION: Flavida Point AREA: Strait of Georgia

START: Lat. 49 ° 43.06 'N Long. 124 ° 40.75 'W

END: Lat. 49 ° 44.08 'N Long. 124 ° 42.2 'W

GEAR: Engel 434 MWT START TIME (PST): 1603 DURATION: 27 min.

BOTTOM DEPTH m: Start: 351 End: 357 Est. Av. Depth: 354

NET DEPTH RANGE m: Foot rope 15-18 m Est. Av. Depth: 325

DIRECTION OF SET °true: 322 SPEED kn: 2.5 DISTANCE TRAVELLED: 1.6 mi.

SET ON: 318-333 m WATER CONDITION: light chop TIDE: -

WIND DIRECTION: S WIND SPEED: 15 RECORDER: MSS

TTM: _____ TDM: _____ BT: 13 OTHER OCEANOGRAPHIC DATA: _____

REMARKS: Net opening 13.7 m; warp length 823

SOUNDER SUMMARY: Layer 326 m-337 m.
Net foul--most of catch lost.

Appendix Table 1 (cont'd)

VESSEL: G.B. REED DATE: Yr 76 Mo Apr. Day 01 SET/HAUL NO: 15

LOCATION: Baker Passage (Toba) AREA: Strait of Georgia

START: Lat. 50 ° 01.25' N Long. 124 ° 52.9 ' W

END: Lat. 49 ° 59.8 ' N Long. 124 ° 51.7 ' W

GEAR: Engel 434 MWT START TIME (PST) : 0825 DURATION: 30 min.

BOTTOM DEPTH m: Start: 274 End: 267 Est. Av. Depth: 270

NET DEPTH RANGE m: 176-183 Est. Av. Depth: 180

DIRECTION OF SET °true: 142 SPEED kn: 3.0 DISTANCE TRAVELLED: - mi.

SET ON: _____ WATER CONDITION: Calm TIDE: _____

WIND DIRECTION: - WIND SPEED: - RECORDER: MSS

TTM: _____ TDM: _____ BT: - OTHER OCEANOGRAPHIC DATA: _____

REMARKS: Net opening 13.7; warp length 549 m

SOUNDER SUMMARY: Very light layer 146-201, few single targets. Net ripped.

VESSEL: G.B. REED DATE: Yr 76 Mo Apr. Day 01 SET/HAUL NO: 16

LOCATION: Mitlenatch Is. AREA: Strait of Georgia

START: Lat. 49° 55.5'N Long. 125° 03.25'W

END: Lat. 49° 57.2'N Long. 125° 04.40'W

GEAR: Engel 434 MWT START TIME (PST): 1134 DURATION: 30 min.

BOTTOM DEPTH m: Start: 282 End: 271 Est. Av. Depth: 276

NET DEPTH RANGE m: 156-183 Est. Av. Depth: 170

DIRECTION OF SET °true: 336 SPEED kn: 3 DISTANCE TRAVELLED: 1.8 mi.

SET ON: _____ WATER CONDITION: calm TIDE: _____

WIND DIRECTION: _____ WIND SPEED: ≈ 9 RECORDER: MSS

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: warp length 595 m

SOUNDER SUMMARY: Net sounder not working.

Appendix Table 1 (cont'd)

VESSEL: G.B.REED DATE: Yr 76 Mo Apr. Day 01 SET/HAUL NO: 17

LOCATION: Sentry Shoal AREA: Strait of Georgia

START: Lat. 49° 50.8'N Long. 124°51.4' W

END: Lat. 49° 49.2'N Long. 124°49.5' W

GEAR: Engel 434 MWT START TIME (PST): 1347 DURATION: 30 min.

BOTTOM DEPTH m: Start: 329 End: 322 Est. Av. Depth: 326

NET DEPTH RANGE m: 201 Est. Av. Depth: 201

DIRECTION OF SET °true: 130 SPEED kn: ≈3 DISTANCE TRAVELLED: 1.55 mi.

SET ON: - WATER CONDITION: Glass TIDE: -

WIND DIRECTION: - WIND SPEED: - RECORDER: MSS

TTM: _____ TDM: _____ BT: _____ OTHER OCEANOGRAPHIC DATA: _____

REMARKS: _____

SOUNDER SUMMARY: Very light layer 139 to 165 m. Layer of single fish 183-220 m. Very light.

VESSEL: G.B. REED DATE: Yr 76 Mo Apr. Day 01 SET/HAUL NO: 18

LOCATION: Greil Point (Malaspina Str AREA: Strait of Georgia

START: Lat. 49° 47.6' N Long. 124° 31.8' W

END: Lat. 49° 46.5' Long. 124° 30.7' W

GEAR: Engel 434 MWT START TIME (PST): 1557 DURATION: 30 min.

BOTTOM DEPTH m: Start: 212 End: 325 Est. Av. Depth: 268

NET DEPTH RANGE m: 190-210 Est. Av. Depth: 200

DIRECTION OF SET °true: 145 SPEED kn: 2.5-3 DISTANCE TRAVELLED: 1.3 mi.

SET ON: _____ WATER CONDITION: ripple TIDE: _____

WIND DIRECTION: - WIND SPEED: - RECORDER: MSS & ?

TTM: _____ TDM: _____ BT: - OTHER OCEANOGRAPHIC DATA: _____

REMARKS: Net open 12.8: Warp length 458.

SOUNDER SUMMARY: Light layer 142-160 m. Set on layer of individual targets.

Appendix Table 1 (cont'd)

VESSEL: G. B. REED DATE: Yr 76 Mo Apr. Day 02 SET/HAUL NO: 19

LOCATION: Jervis Inlet (Malaspina) AREA: Strait of Georgia

START: Lat. 49° 40.15'N Long. 124° 15.2' W

END: Lat. 49° 38.9'N Long. 124° 12.8'W

GEAR: Engel 434 MWT START TIME (PST) : 0832 DURATION: 30 min.

BOTTOM DEPTH m: Start: 358 End: 356 Est. Av. Depth: 357

NET DEPTH RANGE m: 216-196 Est. Av. Depth: 206

DIRECTION OF SET °true: 136 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Calm TIDE: _____

WIND DIRECTION: _____ WIND SPEED: _____ RECORDER: MSS

TTM: _____ TDM: _____ BT: 18 OTHER OCEANOGRAPHIC DATA: _____

REMARKS: net opening 12.6: warp length: 686

SOUNDER SUMMARY: Medium density scatter 183-220 m.

VESSEL: G.B.REED DATE: Yr 76 Mo Apr. Day 02 SET/HAUL NO: 20

LOCATION: Point Upwood AREA: Strait of Georgia

START: Lat. 49° 30.8' N Long. 124° 06.0'W

END: Lat. 49° 59.15' N Long. 124° 05.0'W

GEAR: Engel 434 MWT START TIME (PST): 1033 DURATION: 30 min.

BOTTOM DEPTH m: Start: 369 End: 379 Est. Av. Depth: 374

NET DEPTH RANGE m: _____ Est. Av. Depth: 183

DIRECTION OF SET °true: 155 SPEED kn: _____ DISTANCE TRAVELLED: _____ mi.

SET ON: _____ WATER CONDITION: Calm TIDE: _____

WIND DIRECTION: _____ WIND SPEED: _____ RECORDER: MSS

TTM: _____ TDM: _____ BT: 19 OTHER OCEANOGRAPHIC DATA: _____

REMARKS: Net opening 12.8: warp length: 641.

SOUNDER SUMMARY:

Appendix Table 2. Species composition by set. G.B. REED, March 22-April 2, 1976.

Set no.	1		2		3		4		5	
Total catch (kg)	37		573		323		691		161	
Duration (min)	30		30		30		30		30	
Species	wt.	no.	wt.	no.	wt.	no.	wt.	no.	wt.	no.
Pacific hake	5	9	372	832	205	482	579	1029[a]	110	257
Walleye pollock	9	14	170	273	21	32	40	77	22	41
Spiny dogfish	22	6	30	21	96	5	68	68	28	24
Brown cat shark	-	-	-	-	1	2	1	1	1	2
Northern smoothtongue	-	-	-	-	in mesh		in mesh		in mesh	
Eulachon	-	-	-	-	-	-	+[b]	1	+	4
Northern lampfish	-	-	in mesh		-	-	-	-	-	-
Pacific herring	-	-	-	-	-	-	-	-	-	-
Chinook salmon	-	-	-	-	-	-	-	-	-	-
Pacific cod	-	-	-	-	-	-	-	-	-	-
Pacific lamprey	-	-	+	1	-	-	-	-	-	-
Unidentified snailfish	-	-	-	-	-	-	-	-	-	-
Dover sole	-	-	-	-	-	-	-	-	-	-
English sole	-	-	-	-	-	-	-	-	+	1
Splitnose rockfish	-	-	<0.5	1	-	-	-	-	-	-
Plainfin midshipman	-	-	-	-	-	-	-	-	-	-
Glass shrimp	-	-	in mesh		-	-	in mesh		in mesh	
Squid	<0.5	1	+	-	-	—	3	9	-	1

Appendix Table 2 (cont'd)

Set no.	6		7		8		9		10	
Total catch (kg)	1128		111		366		334		86	
Duration (min)	30		30		30		30		30	
Species	wt.	no.	wt.	no.	wt.	no.	wt.	no.	wt.	no.
Pacific hake	1092	1806[a]	9	13	61	133	155	357	19	111
Walleye pollock	16	22	69	135	193	291	114	246	37	67
Spiny dogfish	13	9	19	12	103	48	61	21	28	27
Brown cat shark	6	11	-	-	1	1	1	4	1	2
Northern smoothtongue	-	-	-	-	-	-	-	-	in mesh	
Eulachon	-	-	11	171	6	90	-	-	-	-
Northern lampfish	-	-	-	-	-	-	-	-	<0.5	100
Pacific herring	-	-	+	1	+	1	+	1	-	-
Chinook salmon	-	-	-	-	-	-	1	1	-	-
Pacific cod	-	-	-	-	-	-	-	-	-	-
Pacific lamprey	-	-	-	-	-	-	-	-	-	-
Unidentified snailfish	-	-	-	-	-	-	-	-	-	-
Dover sole	-	-	-	-	-	-	-	-	-	-
English sole	-	-	-	-	-	-	-	-	-	-
Splitnose rockfish	-	-	-	-	-	-	-	-	-	-
Plainfin midshipman	-	-	-	-	-	-	-	-	-	-
Glass shrimp	-	-	-	-	-	-	-	-	<1	200
Squid	1	1	3	5	2	7	2	2	0.5	2

Appendix Table 2 (cont'd)

Set no.	11		12		13		14		15	
Total catch (kg)	161		296		342		52		89	
Duration (min)	30		31		30		27		30	
Species	wt.	no.	wt.	no.	wt.	no.	wt.	no.	wt.	no.
Pacific hake	140	358	37	119	314	528	34	61	12	36
Walleye pollock	2	2	4	9	3	3	15	25	6	6
Spiny dogfish	15	35	185	210	25	21	3	2	71	67
Brown cat shark	-	-	-	-	-	-	-	-	-	-
Northern smoothtongue	in mesh		-	-	-	-	-	-	+	50
Eulachon	-	-	+	1	-	-	-	-	-	-
Northern lampfish	-	-	-	-	-	-	-	-	+	25
Pacific herring	-	-	+	1	-	-	-	-	-	-
Chinook salmon	-	-	-	-	-	-	-	-	-	-
Pacific cod	4	1	2	1	-	-	-	-	-	-
Pacific lamprey	+	1	-	-	-	-	-	-	-	-
Unidentified snailfish	-	-	-	-	-	-	-	-	-	-
Dover sole	-	-	-	-	-	-	-	-	-	-
English sole	-	-	3	12	-	-	-	-	-	-
Splitnose rockfish	-	-	2	5	-	-	-	-	-	-
Plainfin midshipman	-	-	59	-	-	-	-	-	-	-
Glass shrimp	in mesh		-	-	-	-	-	-	-	-
Squid	in mesh		4	10	-	-	-	-	+	50

Appendix Table 2 (cont'd)

Set no.	16		17		18		19		20		Total[c]	
Total catch (kg)	67		76		72		229		192		5406	
Duration (min)	30		30		30		30		30			
Species	wt.	no.	wt.	no.	wt.	no.	wt.	no.	wt.	no.	wt.	no.
Pacific hake	34	41	57	164	43	129	207	516	143	511	3,628	7,492
Walleye pollock	1	1	3	3	12	18	8	12	32	56	777	1,333
Spiny dogfish	30	91	16	20	17	10	11	11	14	6	855	754
Brown cat shark	–	–	+	1	–	–	2	4	3	5	17	33
Northern smoothtongue	+	50	in mesh		in mesh		+	25	in mesh		–	125
Eulachon	–	–	–	–	–	–	–	–	–	–	17	267
Northern lampfish	2	160	in mesh		in mesh		–	–	in mesh		2.5	310
Pacific herring	–	–	–	–	–	–	–	–	–	–	–	4
Chinook salmon	–	–	–	–	–	–	–	–	–	–	1	1
Pacific cod	–	–	–	–	–	–	–	–	–	–	6	2
Pacific lamprey	–	–	–	–	–	–	+	1	–	–	–	3
Unidentified snailfish	+	2	–	–	–	–	–	–	+	2	–	4
Dover sole	<1	1	–	–	–	–	–	–	–	–	<1	1
English sole	–	–	–	–	–	–	–	–	+	1	3	14
Splitnose rockfish	–	–	–	–	–	–	–	–	–	–	<5.5	<6
Plainfin midshipman	–	–	–	–	–	–	–	–	–	–	59	–
Glass shrimp	+	50	in mesh		in mesh		+	30	–	–	<1	280
Squid	–	–	–	–	–	–	+	1	+	1	17	90

[a]Computed value.

[b]+represents minor quantities present in catch.

[c]Totals are a summation of values only and do not represent total catches as weights and numbers are not available for all tows.

Appendix Table 3. Scientific and common names of species captured.

Common name	Scientific name
Pacific hake	Merluccius productus
Walleye pollock	Theragra chalcogramma
Spiny dogfish	Squalus acanthias
Brown cat shark	Apristurus brunneus
Northern smoothtongue	Leuroglossus stilbius schmidti
Eulachon	Thaleichthys pacificus
Northern lampfish	Stenobrachius leucopsarus
Pacific herring	Clupea harengus pallasi
Chinook salmon	Oncorhynchus tshawytscha
Pacific cod	Gadus macrocephalus
Pacific lamprey	Lampetra tridentata
Unidentified snailfish	Cyclopteridae
Dover sole	Microstomus pacificus
English sole	Parophrys vetulus
Splitnose rockfish	Sebastes diploproa
Plainfin midshipman	Porichthys notatus
Glass shrimp	Pasiphaea pacificus
Squid	Loligo spp.

Appendix Table 4. Length frequency[a] of Pacific hake. G.B. REED, March 22-April 2, 1976.

Fork length (cm)	Set no. 1			2			3			4			5			6		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	1	-	-	3	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	16	-	-	8	-	-	-	-	1	1	-	-	-
1	-	-	-	-	-	7	-	-	11	-	-	1	-	4	4	-	-	-
2	-	-	-	-	-	3	-	-	5	-	-	0	-	2	2	-	-	-
3	-	-	-	-	-	1	-	-	1	-	-	0	-	0	0	-	-	-
4	-	-	-	-	-	0	-	-	0	-	-	0	-	1	1	-	-	-
5	-	-	-	-	-	0	-	-	0	-	-	0	-	0	0	-	-	-
6	-	-	-	-	—	0	-	-	0	-	-	0	-	0	0	-	-	-
7	-	-	-	-	-	0	-	-	0	-	-	0	-	0	0	-	-	-
8	-	-	-	-	-	0	-	-	0	-	-	0	-	0	0	-	-	-
9	-	-	-	-	-	0	-	2	2	-	-	0	-	0	0	-	-	-
20	-	-	-	-	-	4	1	3	4	-	-	0	1	2	3	-	-	-
1	-	-	-	5	3	9	3	4	7	1	-	1	3	0	3	-	-	-
2	-	-	-	2	8	12	4	3	7	0	1	1	3	4	7	-	-	-
3	-	-	-	2	2	7	10	5	15	4	1	5	9	6	15	-	-	-
4	-	-	-	5	9	15	4	1	5	3	2	5	6	5	11	-	-	-
5	-	-	-	4	0	6	5	3	8	3	2	5	6	6	12	-	-	-
6	-	-	-	1	2	3	2	1	3	0	2	2	1	4	5	-	-	-
7	-	-	-	3	2	5	0	0	0	0	1	1	1	0	1	-	-	-
8	-	-	-	0	0	0	0	0	0	1	0	1	0	1	1	-	-	-
9	-	-	-	0	0	0	0	0	0	0	0	0	0	1	1	-	-	-
30	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-
1	-	-	-	0	0	0	0	0	0	0	1	1	0	1	1	-	-	-
2	-	-	-	0	0	0	0	0	0	1	0	1	1	0	1	-	-	-
3	-	-	-	0	1	1	0	0	0	0	1	1	2	1	3	-	-	-
4	-	-	-	1	0	3	3	0	3	1	2	3	0	0	0	-	-	1
5	-	-	-	9	1	12	8	0	8	4	1	5	0	1	1	1	-	2
6	-	2	2	16	3	28	14	0	14	4	3	7	2	0	2	1	-	2
7	-	0	0	31	2	40	9	0	9	3	1	4	0	3	3	5	-	8
8	-	0	0	32	1	50	13	2	15	6	2	8	2	0	2	2	5	13
9	1	0	1	35	7	53	22	3	25	6	7	13	1	1	2	3	3	9
40	0	0	0	41	8	64	19	3	22	14	16	30	2	1	3	5	4	22
1	0	0	0	22	7	37	19	6	25	11	22	33	4	0	4	11	5	34
2	1	0	1	38	8	59	36	5	41	23	17	40	11	1	12	21	8	53
3	1	0	1	43	9	63	47	8	55	20	31	51	26	2	28	22	13	66
4	0	0	0	49	29	105	34	17	51	20	50	70	22	5	27	23	15	76
5	1	0	1	26	32	74	31	18	49	29	52	81	12	15	27	15	18	64
6	1	0	1	20	29	65	16	15	31	19	41	60	8	11	19	12	12	47
7	-	1	1	9	24	41	11	15	26	7	38	45	14	9	23	2	15	35
8	-	0	0	3	12	22	5	8	13	3	18	21	2	14	16	1	7	20
9	-	1	1	3	8	16	2	8	10	0	16	16	0	6	6	-	4	7

Appendix Table 4 (cont'd)

Fork length (cm)	Set no. 1			2			3			4			5			6		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
50	-	-	-	-	2	5	-	3	3	2	10	12	1	1	2	-	4	5
1	-	-	-	-	1	2	-	2	2	-	2	2	0	1	1	-	1	3
2	-	-	-	-	1	2	-	1	1	-	5	5	1	4	5	-	2	3
3	-	-	-	-	1	1	-	-	-	-	4	4	-	2	2	-	-	1
4	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	5	4	9	400	212	832	318	136	482	185	351	537	141	116	257	124	116	471

Appendix Table 4 (cont'd)

Fork length (cm)	Set no. 7			8			9			10			11			12		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
8	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	-	-
9	-	-	-	-	-	4	-	-	-	-	-	-	-	-	2	-	-	3
10	-	-	-	-	-	7	-	-	-	-	-	2	-	-	4	-	-	10
1	-	-	-	-	-	2	-	-	1	-	-	1	-	-	0	-	-	15
2	-	-	-	-	-	6	-	-	0	-	-	0	-	-	1	-	-	10
3	-	-	-	-	-	1	-	-	0	-	-	0	-	-	1	-	-	0
4	-	-	-	-	-	0	-	-	0	-	-	0	-	-	0	-	-	2
5	-	-	-	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0
6	-	-	-	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0
7	-	-	-	-	-	1	-	-	0	-	-	0	-	-	0	-	-	0
8	-	-	-	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0
9	-	-	-	-	-	0	-	1	1	-	-	0	-	-	0	1	-	1
20	-	-	-	2	-	2	2	0	2	1	-	1	-	-	0	1	-	1
1	-	-	-	0	-	0	4	5	9	4	1	5	-	2	2	1	-	1
2	-	-	-	1	2	3	2	0	2	2	4	6	1	1	2	0	1	1
3	-	-	-	2	0	2	7	8	15	6	6	12	4	1	5	2	2	4
4	-	-	-	0	1	1	15	13	28	11	10	21	1	0	1	2	0	2
5	-	-	-	1	0	1	14	8	22	9	2	11	3	2	5	2	2	4
6	-	-	-	1	0	1	13	5	18	4	6	10	0	0	0	0	0	0
7	-	-	-	0	1	1	2	1	3	5	2	7	0	0	0	0	2	2
8	-	-	-	0	0	0	3	0	3	1	2	3	0	0	0	0	0	0
9	-	-	-	0	0	0	4	1	5	0	1	1	0	0	0	0	0	0
30	-	-	-	0	1	1	0	1	1	1	1	2	0	0	0	0	3	3
1	-	-	-	0	0	0	0	1	1	1	0	1	1	1	2	0	1	1
2	-	-	-	0	0	0	1	1	2	2	0	2	1	0	1	2	0	2
3	-	-	-	0	0	0	1	0	1	1	1	2	2	0	2	1	0	1
4	-	-	-	0	0	0	0	0	0	0	1	1	6	3	9	1	2	3
5	-	-	-	0	1	1	0	2	2	2	2	4	11	3	14	0	1	1
6	-	-	-	0	0	0	3	0	3	1	0	1	31	4	35	0	0	0
7	-	-	-	1	0	1	1	2	3	1	1	2	37	5	42	0	2	2
8	-	-	-	1	0	1	0	0	0	1	4	5	45	6	51	0	0	0
9	-	1	1	2	3	5	4	1	5	1	1	2	34	7	41	0	3	3
40	-	0	0	0	0	0	6	0	6	0	2	2	30	7	37	0	1	1
1	-	0	0	2	0	2	14	1	15	0	0	0	18	7	25	0	1	1
2	-	0	0	0	0	0	22	4	26	0	0	0	4	4	8	1	0	1
3	-	0	0	7	5	12	32	2	34	0	0	0	9	9	18	4	4	8
4	-	2	2	3	6	9	31	3	34	2	1	3	6	1	7	1	6	7
5	-	1	1	3	8	11	24	7	31	-	1	1	1	8	9	1	3	4
6	-	0	0	4	9	13	21	7	28	-	1	1	2	3	5	0	3	3
7	-	3	3	4	17	21	16	8	24	-	0	0	1	7	8	2	3	5
8	-	1	1	0	6	6	6	7	13	-	1	1	0	7	7	0	3	3
9	-	2	2	2	5	7	3	6	9	-	0	0	1	4	5	1	1	2

Appendix Table 4 (cont'd)

Fork length (cm)	Set no. 7			8			9			10			11			12		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
50	–	2	2	0	4	4	1	4	5	–	1	1	1	0	1	–	1	1
1	–	0	0	0	2	2	–	4	4	–	–	–	–	1	1	–	3	3
2	–	0	0	0	1	1	–	0	0	–	–	–	–	2	2	–	1	1
3	–	0	0	0	1	1	–	0	0	–	–	–	—	0	0	–	2	2
4	–	1	1	0	0	0	–	1	1	–	–	–	–	0	0	–	0	0
5	–	–	–	1	0	1	–	–	–	–	–	–	–	0	0	–	1	1
6	–	–	–	–	0	0	–	–	–	–	–	–	–	1	1	–	0	0
7	–	–	–	–	0	0	–	–	–	–	–	–	–	0	0	–	1	1
8	–	–	–	–	0	0	–	–	–	–	–	–	–	1	1	–	1	1
9	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–	1	1
60	–	–	–	–	–	–	–	–	–	–	–	—	–	–	–	–	0	0
1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0
2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Total	0	13	13	37	74	133	252	104	357	56	52	111	250	97	358	23	56	119

Appendix Table 4 (cont'd)

Fork length (cm)	Set no. 13			14			15			16			17			18		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
8	–	–	–	–	–	–	–	–	2	–	–	–	–	–	3	–	–	1
9	–	–	–	–	–	–	–	–	6	–	–	–	–	–	7	–	–	2
10	–	–	–	–	–	–	–	–	2	–	–	–	–	–	20	–	–	4
1	–	–	–	–	–	–	–	–	0	–	–	–	–	–	6	–	–	3
2	–	–	–	–	–	–	–	–	0	–	–	–	–	–	3	–	–	1
3	–	–	–	–	–	–	–	–	0	–	–	–	–	–	0	–	–	1
4	–	–	–	–	–	–	–	–	0	–	–	–	–	–	1	–	–	0
5	–	–	–	–	–	–	–	–	0	–	–	–	–	–	0	–	–	0
6	–	–	–	–	–	–	–	–	0	–	–	–	–	–	0	–	–	0
7	–	–	–	–	–	–	–	–	0	–	–	–	1	–	1	–	–	0
8	1	–	1	–	–	–	–	–	0	–	–	–	0	–	0	–	–	0
9	0	–	0	–	–	–	–	–	0	–	–	–	2	2	4	–	–	0
20	0	–	0	–	–	–	–	–	0	1	1	2	3	1	4	–	1	1
1	0	–	0	–	–	–	–	1	1	1	0	1	1	3	4	–	0	0
2	0	–	0	1	–	1	–	2	2	1	2	3	1	2	3	2	1	3
3	0	–	0	0	–	0	–	0	0	0	4	5	3	2	5	2	2	4
4	0	–	0	0	–	0	–	0	0	2	0	2	0	1	1	2	1	3
5	0	–	0	0	1	1	–	0	0	0	1	1	0	0	0	0	2	2
6	0	–	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0
7	0	–	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
8	0	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	2	–	2	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
5	0	–	0	0	1	1	0	0	0	3	0	3	0	0	0	6	0	6
6	2	–	2	1	0	1	1	0	1	2	0	2	0	0	0	10	0	10
7	3	1	4	0	0	0	0	0	0	1	1	2	2	0	2	4	2	6
8	9	2	11	1	1	2	0	0	0	1	0	1	1	0	1	10	2	12
9	14	1	15	1	1	2	0	0	0	1	0	1	2	0	2	10	3	13
40	14	6	20	1	1	2	1	0	1	0	0	0	3	0	3	10	5	15
1	17	9	26	1	0	1	0	0	0	0	2	2	1	0	1	7	4	11
2	36	9	45	1	3	4	0	1	1	0	0	0	6	0	6	5	2	7
3	44	13	57	1	5	6	0	1	1	2	2	4	12	1	13	4	4	8
4	45	18	63	4	2	6	3	3	6	0	2	2	13	2	15	3	2	5
5	44	22	66	2	3	5	0	1	1	0	2	2	15	3	18	2	1	3
6	33	35	68	3	1	4	0	3	3	0	0	0	7	1	8	1	2	3
7	22	34	56	2	8	10	0	3	3	0	3	3	10	4	14	–	1	1
8	13	21	34	1	5	6	0	2	2	0	3	3	8	0	8	–	–	–
9	7	22	29	0	3	3	1	0	1	0	–	0	2	2	4	–	–	–

Appendix Table 4 (cont'd)

Fork length (cm)	Set no. 13			14			15			16			17			18		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
50	8	5	13	1	1	2	-	0	0	1	-	1	1	0	1	-	-	-
1	0	6	6	-	1	1	-	0	0	-	-	-	-	1	1	-	-	-
2	1	4	5	-	0	0	-	1	1	-	-	-	-	1	1	-	-	-
3	-	0	0	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	315	213	528	21	40	61	7	19	36	18	23	41	96	28	164	80	37	129

Appendix Table 4 (cont'd)

Fork length (cm)	Set no. 19 M	19 F	19 T	20 M	20 F	20 T	Total M	Total F	Total T
7	–	–	–	–	–	–	–	–	1
8	–	–	2	–	–	4	–	–	15
9	–	–	8	–	–	9	–	–	45
10	–	–	16	–	–	10	–	1	100
1	–	–	6	–	–	10	–	4	67
2	–	–	2	–	–	3	–	2	36
3	–	–	0	–	–	0	–	0	5
4	–	–	0	–	–	0	–	1	4
5	–	–	0	–	–	0	–	0	0
6	–	–	0	–	–	0	–	0	0
7	1	–	1	–	–	0	2	0	3
8	0	–	0	–	–	0	0	0	0
9	1	–	1	–	–	1	5	5	11
20	0	1	1	–	–	8	12	9	33
1	0	0	0	1	5	17	24	23	59
2	5	0	5	3	3	21	27	33	77
3	2	2	4	8	1	42	63	44	143
4	0	2	2	8	4	47	58	51	145
5	3	0	3	8	4	39	62	31	122
6	0	2	2	1	1	13	23	27	61
7	0	0	0	0	2	12	12	12	34
8	1	0	1	1	0	6	8	3	16
9	0	0	0	1	0	3	5	3	10
30	0	0	0	0	1	2	1	7	9
1	0	1	1	1	0	1	3	6	9
2	0	0	0	1	0	1	9	1	10
3	1	0	1	0	1	1	8	5	13
4	5	1	6	4	0	4	24	9	36
35	16	3	19	2	2	4	2	18	83
6	24	5	29	17	2	19	129	19	158
7	38	7	45	16	3	19	152	30	192
8	51	5	56	20	7	27	195	37	255
9	56	8	64	25	7	32	218	57	289
40	41	16	57	17	4	21	204	74	306
1	24	12	36	15	2	17	166	78	270
2	23	12	35	15	5	20	243	79	359
3	21	9	30	11	3	14	306	121	469
4	17	6	23	12	11	23	288	181	534
5	7	8	15	17	7	24	230	210	487
6	11	13	24	10	5	15	168	191	398
7	5	4	9	4	8	12	109	205	340
8	1	3	4	0	3	3	43	121	183
9	0	4	4	1	2	3	23	94	125
50	1	0	1	–	2	2	17	40	61
1	–	1	1	–	0	0	0	26	29
2	–	0	0	–	2	2	2	25	29
3	–	2	2	–	–	–	0	15	16
4	–	–	–	–	–	–	0	4	4
5	–	–	–	–	–	–	1	3	4
6	–	–	–	–	–	–	–	1	1
7	–	–	–	–	–	–	–	1	1
8	–	–	–	–	–	–	–	3	3
9	–	–	–	–	–	–	–	3	3
60	–	–	–	–	–	–	–	1	1
1	–	–	–	–	–	–	–	0	0
2	–	–	–	–	–	–	–	1	1
Total	355	127	516	219	97	511	2902	1915	5665

[a]The total includes unsexed fish.

Appendix Table 5. Length frequency[a] of walleye pollock. G.B. REED, March 22-April 2, 1976.

Fork length (cm)	Set no. 1			2			3			4		
	M	F	T	M	F	T	M	F	T	M	F	T
27	-	-	-	1	-	1	-	-	-	1	-	1
8	-	-	-	1	-	1	-	-	-	0	1	1
9	-	-	-	0	1	1	-	-	-	0	1	1
30	-	-	-	2	1	3	-	-	-	0	1	1
1	-	-	-	4	1	5	-	-	-	0	0	0
2	-	-	-	1	2	3	-	-	-	0	0	0
3	-	-	-	7	2	9	-	-	-	2	1	3
4	-	-	-	4	3	7	2	-	2	2	0	2
5	-	-	-	9	11	20	3	1	4	4	1	5
6	-	-	-	11	9	20	0	3	3	8	2	10
7	1	-	1	10	5	15	1	1	2	4	5	9
8	0	-	0	7	22	29	-	1	1	6	2	8
9	0	-	0	5	10	15	-	2	2	3	0	3
40	0	-	0	1	9	10	-	1	1	4	6	10
1	0	-	0	6	6	12	-	0	0	2	1	3
2	1	-	1	2	10	12	-	1	1	4	3	7
3	3	1	4	2	14	16	-	1	1	3	0	3
4	2	1	3	8	8	16	-	2	2	1	1	2
5	0	0	0	4	11	15	-	3	3	0	3	3
6	2	0	2	3	20	23	-	4	4	1	1	2
7	2	1	3	4	13	17	-	3	3	1	0	1
8	-	-	-	2	13	15	-	2	2	-	1	1
9	-	-	-	-	12	12	-	0	0	-	0	0
50	-	-	-	-	1	1	-	1	1	-	0	0
1	-	-	-	-	0	0	-	-	-	-	0	0
2	-	-	-	-	1	1	-	-	-	-	0	0
3	-	-	-	-	-	-	-	-	-	-	0	0
4	-	-	-	-	-	-	-	-	-	-	0	0
5	-	-	-	-	-	-	-	-	-	-	0	0
6	-	-	-	-	-	-	-	-	-	-	1	1
Total	11	3	14	94	185	279	6	26	32	46	31	77

Appendix Table 5 (cont'd)

Fork length (cm)	Set no. 5			6			7			8		
	M	F	T	M	F	T	M	F	T	M	F	T
27	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	1	-	1	-	-	-
9	1	-	1	-	-	-	0	-	0	-	-	-
30	2	-	2	-	-	-	0	-	0	-	-	2
1	0	-	0	-	-	-	1	1	2	3	1	5
2	0	1	1	-	-	-	0	1	1	1	0	3
3	2	0	2	-	-	-	1	0	1	3	1	7
4	4	0	4	-	-	-	3	4	7	8	1	15
5	2	1	3	1	-	1	11	3	14	9	1	25
6	2	1	3	0	-	0	1	10	11	19	4	38
7	1	2	3	0	-	0	7	21	28	20	6	36
8	1	0	1	1	2	3	5	9	14	14	9	34
9	0	2	2	0	2	2	5	15	20	9	13	29
40	0	2	2	0	1	1	1	4	5	10	2	17
1	3	0	3	0	2	2	1	2	3	5	2	12
2	1	1	2	1	1	2	0	4	4	13	1	14
3	1	0	1	0	1	1	1	2	3	8	1	15
4	1	2	3	1	0	1	1	5	6	4	2	8
5	-	4	4	0	1	1	-	2	2	4	1	6
6	-	0	0	0	0	0	-	2	2	2	1	5
7	-	2	2	1	2	3	-	2	2	0	3	7
8	-	0	0	-	3	3	-	1	1	3	3	6
9	-	0	0	-	1	1	-	0	0	1	0	2
50	-	1	1	-	1	1	-	2	2	-	0	0
1	-	0	0	-	-	-	-	1	1	-	1	1
2	-	0	0	-	-	-	-	1	1	-	0	1
3	-	1	1	-	-	-	-	1	1	-	2	2
4	-	-	-	-	-	-	-	2	2	-	1	1
5	-	-	-	-	-	-	-	0	0	-	-	-
6	-	-	-	-	-	-	-	1	1	-	-	-
Total	21	20	41	5	17	22	39	96	135	136	56	291

Appendix Table 5 (cont'd)

Fork length (cm)	Set no. 9 M	9 F	9 T	10 M	10 F	10 T	11 M	11 F	11 T	12 M	12 F	12 T
27	-	-	-	-	-	-	-	-	-	-	-	-
8	1	-	1	1	-	1	-	-	-	-	1	1
9	0	-	0	0	-	0	-	-	-	-	0	0
30	1	-	1	3	-	3	-	-	-	-	0	0
1	1	-	1	0	1	1	-	-	-	1	0	1
2	4	2	6	0	1	1	-	-	-	0	1	1
3	6	1	7	1	0	1	-	-	-	0	0	0
4	13	2	15	0	0	0	-	-	-	0	0	0
5	19	5	24	0	0	0	-	-	-	0	0	0
6	18	6	24	1	1	2	-	-	-	0	0	0
7	10	12	22	2	0	2	-	-	-	0	0	0
8	15	8	23	2	0	2	-	-	-	0	0	0
9	9	13	22	2	0	2	-	-	-	0	1	1
40	13	6	19	0	1	1	-	-	-	0	0	0
1	8	3	11	3	1	4	-	-	-	0	0	0
2	13	5	18	5	0	5	-	-	-	0	0	0
3	7	5	12	14	0	14	-	-	-	0	1	1
4	2	1	3	14	0	14	-	-	-	0	0	0
5	6	5	11	8	0	8	-	-	-	1	0	1
6	2	5	7	4	1	5	-	-	-	-	1	1
7	1	8	9	-	0	0	-	-	-	-	1	1
8	1	4	5	-	0	0	-	2	2	-	1	1
9	0	0	0	-	1	1	-	-	-	-	-	-
50	1	1	2	-	-	-	-	-	-	-	-	-
1	-	1	1	-	-	-	-	-	-	-	-	-
2	-	0	0	-	-	-	-	-	-	-	-	-
3	-	0	0	-	-	-	-	-	-	-	-	-
4	-	1	1	-	-	-	-	-	-	-	-	-
5	-	0	0	-	-	-	-	-	-	-	-	-
6	-	1	1	-	-	-	-	-	-	-	-	-
Total	151	95	246	60	7	67	0	2	2	2	7	9

Appendix Table 5 (cont'd)

Fork length (cm)	Set no. 13 M	13 F	13 T	14 M	14 F	14 T	15 M	15 F	15 T	16 M	16 F	16 T
27	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	2	-	2	-	-	-	-	-	-
4	-	-	-	0	-	0	-	-	-	1	-	1
5	-	-	-	0	-	0	-	-	-	-	-	-
6	-	-	-	0	-	0	-	-	-	-	-	-
7	-	-	-	0	-	0	-	-	-	-	-	-
8	-	-	-	1	-	1	-	-	-	-	-	-
9	1	-	1	1	-	1	-	-	-	-	-	-
40	0	-	0	2	-	2	-	-	-	-	-	-
1	0	-	0	2	-	2	-	-	-	-	-	-
2	0	-	0	1	1	2	-	-	-	-	-	-
3	1	-	1	5	1	6	-	1	1	-	-	-
4	-	1	1	6	0	6	-	0	0	-	-	-
5	-	-	-	1	0	1	-	0	0	-	-	-
6	-	-	-	0	0	0	1	1	2	-	-	-
7	-	-	-	1	0	1	-	1	1	-	-	-
8	-	-	-	-	0	0	-	1	1	-	-	-
9	-	-	-	-	1	1	-	0	0	-	-	-
50	-	-	-	-	-	-	-	0	0	-	-	-
1	-	-	-	-	-	-	-	1	1	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
Total	2	1	3	22	3	25	1	5	6	1	0	1

Appendix Table 5 (cont'd)

Fork length (cm)	Set no. 17 M	17 F	17 T	18 M	18 F	18 T	19 M	19 F	19 T	20 M	20 F	20 T	Total M	Total F	Total T
27	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2
8	-	-	-	-	-	-	-	-	-	-	-	-	4	2	6
9	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3
30	-	-	-	-	-	-	-	-	-	1	-	1	9	2	13
1	-	-	-	-	-	-	-	1	1	0	-	0	10	5	16
2	-	-	-	-	-	-	-	0	0	0	-	0	6	8	16
3	-	-	-	-	-	-	-	1	1	0	2	2	24	8	35
4	-	-	-	-	-	-	-	0	0	3	0	3	40	10	56
5	-	-	-	-	-	-	-	0	0	1	1	2	59	24	98
6	-	-	-	-	2	2	-	2	2	7	1	8	67	41	123
7	-	-	-	-	0	0	-	0	0	3	0	3	59	52	121
8	-	-	-	-	2	2	-	0	0	4	1	5	56	56	123
9	-	-	-	-	0	0	-	1	1	2	0	2	37	59	103
40	-	-	-	1	0	1	-	0	0	2	0	2	34	32	71
1	-	-	-	1	1	2	-	0	0	3	2	5	34	20	59
2	-	-	-	-	0	0	-	0	0	3	0	3	44	27	71
3	-	-	-	-	2	2	-	0	0	1	2	3	46	32	84
4	-	-	-	-	2	2	-	1	1	0	0	0	40	26	68
5	-	1	1	-	1	1	-	0	0	1	3	4	25	35	61
6	-	1	1	-	2	2	-	1	1	3	1	4	18	41	61
7	-	0	0	-	1	1	-	4	4	-	4	4	10	45	59
8	-	1	1	-	1	1	-	1	1	-	2	2	6	36	42
9	-	-	-	-	2	2	-	-	-	-	2	2	1	19	21
50	-	-	-	-	-	-	-	-	-	-	1	1	1	8	9
1	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3
2	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3
3	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4
4	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4
5	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
6	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3
Total	0	3	3	2	16	18	0	12	12	34	22	56	633	607	1339

[a]Totals include unsexed fish.

Appendix Table 6. Length frequency of spiny dogfish. G.B REED, March 22-April 2, 1976.

Total length (cm)	Set no. 1			2			3			4			7			8			9		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	0	1	1	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	2	2	4	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	5	0	5	-	-	-	-	-	-	1	-	1
4	-	-	-	-	-	-	-	-	-	0	2	2	-	-	-	-	-	-	0	-	0
5	-	-	-	-	-	-	-	-	-	1	2	3	-	-	-	-	-	-	0	-	0
6	-	-	-	1	-	1	-	-	-	3	3	6	-	-	-	-	-	-	0	-	0
7	-	-	-	0	-	0	-	-	-	2	5	7	-	-	-	-	-	-	0	-	0
8	-	-	-	1	-	1	-	-	-	4	4	8	-	-	-	-	-	-	0	-	0
9	-	-	-	1	-	1	-	-	-	1	2	3	-	-	-	-	-	-	0	-	0
40	-	-	-	0	-	0	-	-	-	2	1	3	-	-	-	-	-	-	0	-	0
1	-	-	-	2	2	4	-	-	-	1	1	2	-	-	-	1	-	1	0	-	0
2	-	-	-	0	0	0	-	-	-	0	0	0	-	-	-	0	-	0	0	-	0
3	-	-	-	0	0	0	-	-	-	0	2	2	-	-	-	0	-	0	0	-	0
4	-	-	-	1	0	1	1	-	1	0	0	0	-	-	-	0	-	0	0	1	1
5	-	-	-	0	0	0	2	-	2	0	1	1	-	-	-	0	-	0	0	1	1
6	-	-	-	1	0	1	1	-	1	0	2	2	-	1	1	0	1	1	0	-	0
7	-	-	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	0	-	0
8	-	-	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	0	-	0
9	-	-	-	0	0	0	0	-	0	0	0	0	-	1	1	0	0	0	0	-	0
50	-	-	-	0	0	0	0	-	0	0	0	0	-	0	0	1	0	1	0	-	0
1	-	-	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	0	-	0
2	-	-	-	1	0	1	0	-	0	0	0	0	-	0	0	0	0	0	0	-	0
3	-	-	-	0	0	0	1	-	1	1	0	1	-	0	0	1	1	2	0	-	0
4	-	-	-	0	0	0	0	-	0	0	0	0	-	1	1	0	0	0	0	-	0
5	-	-	-	0	0	0	0	-	0	0	0	0	1	0	1	0	0	0	0	-	0
6	-	-	-	1	0	1	2	-	2	0	0	0	0	1	1	0	0	0	0	-	0
7	-	-	-	-	0	0	1	-	1	0	0	0	0	0	0	0	0	0	0	-	0
8	-	-	-	-	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	-	0
9	-	-	-	-	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	-	0
60	-	-	-	-	0	0	0	-	0	0	0	0	0	1	1	0	0	0	0	-	0
1	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	-	0
2	-	-	-	-	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	-	0
3	-	-	-	-	0	0	0	-	0	1	0	1	0	0	0	0	1	1	0	-	0
4	-	-	-	-	0	0	1	-	1	0	0	0	0	1	1	0	0	0	0	-	0
5	-	-	-	-	0	0	0	-	0	0	0	0	0	-	0	0	1	1	0	-	0
6	-	-	-	-	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
7	-	-	-	-	0	0	0	2	2	0	0	0	0	-	0	0	0	0	0	-	0
8	-	-	-	-	0	0	0	0	0	0	0	0	0	-	0	0	1	1	0	-	0
9	-	-	-	-	0	0	0	1	1	0	0	0	0	-	0	0	1	1	0	-	0

Appendix Table 6 (cont'd)

Total length (cm)	Set no. 1			2			3			4			7			8			9		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
70	-	-	-	-	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0
1	-	-	-	-	0	0	0	0	0	0	∪	0	0	-	0	0	0	0	0	-	0
2	-	-	-	-	0	0	1	0	1	0	0	0	0	-	0	0	1	1	0	-	0
3	-	-	-	-	1	1	0	0	0	0	0	0	0	-	0	1	1	2	0	-	0
4	-	-	-	-	1	1	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0
5	-	-	-	-	0	0	1	0	1	1	0	1	0	-	0	0	0	0	0	-	0
6	-	-	-	-	0	0	1	0	1	0	0	0	0	-	0	1	0	1	0	-	0
7	-	-	-	-	0	0	0	0	0	0	0	0	0	-	0	1	0	1	0	1	1
8	-	-	-	-	1	1	1	0	1	0	0	0	0	-	0	0	0	0	0	0	0
9	-	-	—	-	0	0	1	0	1	1	0	1	0	-	0	1	1	2	0	0	0
80	-	-	-	-	2	2	4	0	4	0	0	0	0	-	0	3	0	3	0	0	0
1	-	-	-	-	0	0	3	0	3	1	0	1	2	-	2	2	0	2	1	1	2
2	-	-	-	-	0	0	3	0	3	0	0	0	0	-	0	1	1	2	0	0	0
3	-	1	1	-	0	0	1	0	1	1	1	2	0	-	0	3	0	3	0	1	1
4	-	0	0	-	1	1	1	0	1	1	0	1	0	-	0	3	0	3	1	0	1
5	-	0	0	-	0	0	0	0	0	2	0	2	0	-	0	3	0	3	1	1	2
6	-	0	0	-	0	0	2	0	2	1	0	1	1	-	1	2	0	2	-	2	2
7	-	1	1	-	1	1	0	0	0	-	0	0	1	-	1	2	0	2	-	0	0
8	-	0	0	-	0	0	1	1	2	-	0	0	0	-	0	1	0	1	-	1	1
9	-	0	0	-	0	0	2	0	2	-	1	1	1	-	1	3	0	3	-	2	2
90	-	0	0	-	0	0	2	0	2	-	0	0	-	-	-	0	0	0	-	1	1
1	-	0	0	-	1	1	2	1	3	-	0	0	-	-	-	1	0	1	-	0	0
2	-	0	0	-	0	0	1	0	1	-	0	0	-	-	-	3	0	3	-	0	0
3	-	0	0	-	1	1	0	0	0	-	1	1	-	-	-	-	0	0	-	1	1
4	-	0	0	—	0	0	0	0	0	-	0	0	-	-	-	-	1	1	-	0	0
5	-	1	1	-	1	1	0	0	0	-	0	0	-	-	-	-	0	0	-	0	0
6	-	0	0	-	-	-	1	0	1	-	0	0	-	-	-	-	0	0	-	0	0
7	-	0	0	-	-	-	-	0	0	-	1	1	-	-	-	-	0	0	-	0	0
8	-	1	1	-	-	-	-	0	0	-	0	0	-	-	-	-	0	0	-	0	0
9	-	0	0	-	-	-	-	0	0	-	2	2	-	-	-	-	0	0	-	0	0
100	-	2	2	-	-	-	-	0	0	-	0	0	-	-	-	-	0	0	-	0	0
103	-	-	-	-	-	-	-	0	0	-	0	0	-	-	-	-	0	0	-	1	1
4	-	-	-	-	-	-	-	0	0	-	1	1	-	-	-	-	1	1	-	0	0
5	-	-	-	-	-	-	-	0	0	-	0	0	-	-	-	-	-	-	-	0	0
6	-	-	-	-	-	-	-	1	1	-	0	0	-	-	-	-	-	-	-	1	1
107	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	0	0
110	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	1	1
1	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	0	0
2	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	1	1
124	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	6	6	9	12	21	39	6	45	32	36	68	6	6	12	36	12	48	6	15	21

Appendix Table 6 (cont'd)

Total length (cm)	Set no. 10			11			12			13			14			15			16		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
23	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	3	1	4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	3	8	11	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	7	7	14	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	11	11	22	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	19	10	29	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	4	1	5	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-
3	-	1	1	-	-	-	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-
4	-	0	0	-	-	-	1	1	2	1	-	1	-	-	-	-	-	-	1	-	1
5	-	0	0	-	-	-	2	1	3	0	-	0	-	-	-	-	-	-	0	1	1
6	-	0	0	2	-	2	0	1	1	1	-	1	-	-	-	-	-	-	0	0	0
7	1	0	1	0	-	0	0	1	1	0	1	1	-	-	-	1	-	1	0	0	0
8	0	0	0	0	-	0	1	2	3	1	0	1	-	-	-	1	2	3	0	1	1
9	2	0	2	1	-	1	0	0	0	0	1	1	-	-	-	0	0	0	0	1	1
40	1	3	4	1	-	1	0	0	0	0	0	0	-	-	-	0	1	1	5	1	6
1	0	1	1	1	2	3	0	1	1	5	1	6	-	-	-	0	0	0	4	2	6
2	1	0	1	3	2	5	0	0	0	0	1	1	-	-	-	0	1	1	1	1	2
3	0	1	1	1	0	1	2	0	2	0	0	0	-	-	-	2	2	4	12	4	16
4	1	1	2	3	1	4	1	2	3	1	0	1	-	-	-	1	0	1	10	3	13
5	0	0	0	0	0	0	1	1	2	0	1	1	-	-	-	1	3	4	7	2	9
6	0	1	1	2	0	2	0	1	1	1	0	0	-	1	1	1	2	3	4	2	6
7	0	0	0	3	0	3	2	2	4	0	0	0	-	-	0	0	1	1	3	1	4
8	1	0	1	1	0	1	0	0	0	0	0	0	-	-	0	2	1	3	1	0	1
9	0	0	0	0	0	0	2	0	2	0	0	0	-	-	0	1	1	2	2	2	4
50	0	0	0	3	2	5	1	1	2	0	0	0	-	-	0	1	0	1	2	2	4
1	0	0	0	1	0	1	1	0	1	0	0	0	-	-	0	0	1	1	0	1	1
2	0	0	0	1	0	1	1	0	1	0	0	0	-	-	0	0	0	0	0	1	1
3	0	0	0	1	0	1	0	0	0	0	0	0	-	-	0	4	0	4	0	0	0
4	0	0	0	0	1	1	1	1	2	0	0	0	-	-	0	0	0	0	0	1	1
5	0	0	0	0	0	0	2	1	3	0	0	0	-	-	0	0	1	1	0	0	0
6	0	0	0	0	0	0	2	1	3	0	0	0	-	-	0	1	1	2	0	0	0
7	0	1	1	0	0	0	0	0	0	0	0	0	-	-	0	2	2	4	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	1	0	1	0	0	0
9	0	0	0	0	0	0	1	0	1	2	1	3	-	-	0	1	0	1	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	2	1	3	1	0	1
1	0	1	1	0	0	0	2	1	3	0	0	0	-	-	0	1	0	1	0	1	1
2	1	0	1	0	0	0	0	1	1	0	0	0	-	-	0	0	0	0	0	1	1
3	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	3	1	4	0	1	1
4	0	0	0	0	1	1	0	1	1	0	0	0	-	-	0	0	0	0	0	-	0
5	1	0	1	0	0	0	2	0	2	0	0	0	-	-	0	1	1	2	0	-	0
6	0	0	0	0	0	0	0	1	1	0	0	0	-	-	0	0	2	2	0	-	0
7	0	0	0	1	0	1	2	0	2	0	0	0	-	-	0	0	0	0	0	-	0
8	0	0	0	-	0	0	1	0	1	0	0	0	-	-	0	1	0	1	0	-	0
9	0	0	0	-	0	0	1	0	1	0	0	0	-	-	0	1	1	2	0	-	0

Appendix Table 6 (cont'd)

Total length (cm)	Set no. 10 M	10 F	10 T	11 M	11 F	11 T	12 M	12 F	12 T	13 M	13 F	13 T	14 M	14 F	14 T	15 M	15 F	15 T	16 M	16 F	16 T
70	0	0	0	-	1	1	0	0	0	0	0	0	-	-	0	0	0	0	0	-	0
1	0	0	0	-	-	-	1	0	1	0	0	0	-	-	0	0	0	0	0	-	0
2	0	0	0	-	-	-	0	1	1	0	0	0	-	-	0	0	1	1	0	-	0
3	0	0	0	-	-	-	1	-	1	0	0	0	-	-	0	0	1	1	0	-	0
4	0	1	1	-	-	-	4	-	4	0	0	0	-	-	0	1	0	1	0	-	0
5	1	0	1	-	-	-	1	-	1	0	0	0	-	-	0	0	0	0	0	-	0
6	0	0	0	-	-	-	4	-	4	0	0	0	-	-	0	0	0	0	1	-	1
7	0	0	0	-	-	-	4	-	4	0	0	0	-	-	0	0	0	0	1	-	1
8	0	0	0	-	-	-	5	-	5	0	0	0	-	-	0	1	0	1	0	-	0
9	0	0	0	-	-	-	3	-	3	1	0	1	-	-	0	0	1	1	0	-	0
80	0	0	0	-	-	-	3	-	3	0	0	0	-	-	0	1	0	1	2	-	2
1	1	0	1	-	-	-	5	-	5	1	0	1	-	-	0	0	0	0	0	-	0
2	0	0	0	-	-	-	7	-	7	-	0	0	-	-	0	0	0	0	1	-	1
3	0	0	0	-	-	-	9	-	9	-	0	0	-	-	0	0	0	0	1	-	1
4	0	0	0	-	-	-	2	-	2	-	0	0	-	-	0	2	0	2	0	-	0
5	0	0	0	-	-	-	5	-	5	-	0	0	1	-	1	2	0	2	0	-	0
6	2	0	2	-	-	-	4	-	4	-	0	0	-	-	-	1	0	1	1	-	1
7	2	0	2	-	-	-	2	-	2	-	0	0	-	-	-	0	0	0	0	-	0
8	-	0	0	-	-	-	2	-	2	-	0	0	-	-	-	0	0	0	0	-	0
9	-	0	0	-	-	-	1	-	1	-	0	0	-	-	-	1	0	1	0	-	0
90	-	0	0	-	-	-	0	-	0	-	0	0	-	-	-	-	0	0	1	-	1
1	-	0	0	-	-	-	2	-	2	-	0	0	-	-	-	-	0	0	1	-	1
2	-	0	0	-	-	-	1	-	1	-	0	0	-	-	-	-	0	0	-	-	-
3	-	0	0	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
4	-	0	0	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
5	-	0	0	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
6	-	0	0	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
7	-	1	1	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
8	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
9	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
100	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
103	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
4	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
5	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
6	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
107	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	0	0	-	-	-
110	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-
1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	0	0	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-
124	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
Total	15	12	27	25	10	35	145	65	210	13	8	21	1	1	2	38	29	67	62	29	91

Appendix Table 6 (cont'd)

Total length (cm)	Set no. 17			18			19			20			Total		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
23	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
4	-	-	-	-	-	-	-	-	-	-	-	-	3	1	4
5	-	-	-	-	-	-	-	-	-	-	-	-	3	8	11
6	-	-	-	-	-	-	-	-	-	-	-	-	7	7	14
7	-	-	-	-	-	-	-	-	-	-	-	-	11	11	22
8	-	-	-	-	-	-	-	-	-	-	-	-	19	10	29
9	-	-	-	-	-	-	-	-	-	-	-	-	5	1	6
30	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3
1	-	-	-	-	-	-	-	-	-	-	-	-	2	3	5
2	-	-	-	-	-	-	-	-	-	-	-	-	8	1	9
3	-	-	-	-	-	-	-	-	-	-	-	-	0	4	4
4	-	-	-	-	-	-	-	-	-	-	-	-	4	3	7
5	1	-	1	-	-	-	-	-	-	-	-	-	6	5	11
6	0	-	0	-	-	-	-	-	-	-	-	-	6	6	12
7	0	-	0	-	-	-	-	-	-	-	-	-	6	6	12
8	0	-	0	-	-	-	-	1	1	-	-	-	6	7	13
9	2	-	2	-	-	-	-	0	0	-	-	-	8	3	11
40	2	1	3	-	-	-	-	1	1	-	-	-	10	9	19
1	1	0	1	1	-	1	-	0	0	-	-	-	14	9	23
2	1	1	2	0	1	1	-	2	2	-	-	-	6	11	17
3	1	0	1	0	1	1	-	0	0	-	-	-	19	8	27
4	0	0	0	0	0	0	-	1	1	-	-	-	20	9	29
5	1	0	1	0	0	0	-	0	0	-	-	-	12	11	23
6	1	0	1	0	0	0	-	0	0	-	-	-	10	7	17
7	0	0	0	1	0	1	1	0	1	-	-	-	10	4	14
8	0	0	0	1	0	1	0	0	0	-	-	-	6	2	8
9	0	0	0	0	0	0	0	0	0	-	-	-	6	3	9
50	1	0	1	0	0	0	0	0	0	1	-	1	9	5	14
1	0	0	0	0	0	0	0	0	0	0	-	0	2	2	4
2	0	0	0	0	0	0	0	0	0	0	1	1	3	2	5
3	0	0	0	0	0	0	0	1	1	0	0	0	8	2	10
4	0	0	0	0	0	0	0	0	0	0	0	0	1	4	5
5	0	0	0	0	0	0	0	0	0	0	0	0	3	2	5
6	1	0	1	0	0	0	0	1	1	0	0	0	7	4	11
7	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6
8	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
9	0	0	0	0	0	0	0	0	0	0	0	0	4	1	5
60	0	0	0	0	0	0	0	0	0	0	0	0	3	2	5
1	0	0	0	0	0	0	0	0	0	0	0	0	7	3	10
2	1	0	1	0	0	0	0	0	0	0	0	0	2	2	4
3	0	0	0	0	0	0	0	0	0	0	0	0	4	3	7
4	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4
5	0	0	0	0	0	0	0	0	0	0	0	0	4	2	6
6	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
7	1	0	1	0	0	0	0	0	0	0	0	0	4	2	6
8	0	0	0	1	1	2	0	0	0	0	0	0	3	2	5
9	0	0	0	-	0	0	0	0	0	0	0	0	2	3	5

Appendix Table 6 (cont'd)

Total length (cm)	Set no. 17			18			19			20			Total		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
70	0	0	0	-	0	0	0	0	0	0	0	0	0	1	1
1	0	0	0	-	0	0	0	∪	0	0	0	0	1	0	1
2	0	0	0	-	0	0	0	0	0	0	0	0	1	3	4
3	0	0	0	-	0	0	0	0	0	1	0	1	3	3	6
4	0	1	1	-	0	0	0	0	0	0	0	0	5	3	8
5	0	-	0	-	0	0	0	0	0	0	0	0	4	0	4
6	1	-	1	-	0	0	0	0	0	0	0	0	8	0	8
7	0	-	0	-	0	0	0	0	0	0	1	1	6	2	8
8	0	-	0	-	0	0	1	0	1	0	0	0	8	1	9
9	1	-	1	-	0	0	-	1	1	0	0	0	8	3	11
80	0	-	0	-	0	0	-	0	0	0	0	0	13	2	15
1	0	-	0	-	0	0	-	0	0	1	0	1	17	1	18
2	0	-	0	-	0	0	-	0	0	-	0	0	12	1	13
3	0	-	0	-	0	0	-	0	0	-	0	0	15	3	18
4	0	-	0	-	0	0	-	0	0	-	0	0	10	1	11
5	0	-	0	-	0	0	-	0	0	-	0	0	14	1	15
6	0	-	0	-	0	0	-	0	0	-	0	0	14	2	16
7	0	-	0	-	1	1	-	0	0	-	0	0	7	3	10
8	0	-	0	-	0	0	-	0	0	-	0	0	4	2	6
9	0	-	0	-	0	0	-	0	0	-	0	0	8	3	11
90	0	-	0	-	0	0	-	0	0	-	0	0	3	1	4
1	0	-	0	-	1	1	-	1	1	-	0	0	6	4	10
2	1	-	1	-	0	0	-	-	-	-	0	0	6	0	6
3	-	-	-	-	0	0	-	-	-	-	0	0	0	3	3
4	-	-	-	-	0	0	-	-	-	-	0	0	0	1	1
5	-	-	-	-	0	0	-	-	-	-	0	0	0	2	2
6	-	-	-	-	0	0	-	-	-	-	0	0	1	0	1
7	-	-	-	-	0	0	-	-	-	-	0	0	-	2	2
8	-	-	-	-	0	0	-	-	-	-	0	0	-	1	1
9	-	-	-	-	0	0	-	-	-	-	0	0	-	2	2
100	-	-	-	-	0	0	-	-	-	-	0	0	-	2	2
103	-	-	-	-	0	0	-	-	-	-	0	0	-	1	1
4	-	-	-	-	0	0	-	-	-	-	0	0	-	2	2
5	-	-	-	-	0	0	-	-	-	-	1	1	-	1	1
6	-	-	-	-	1	1	-	-	-	-	-	-	-	3	3
107	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
110	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
111	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
112	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
124	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Total	17	3	20	4	6	10	2	9	11	3	3	6	453	268	721

Appendix Table 7. Length frequency of brown cat shark. G.B. REED, March 22-April 2, 1976.

Total length (cm)	Set no. 4	5	8	10	17	19		20	Total	
	F	M	M	F	M	M	F	M	M	F
39	–	–	–	–	–	–	1	–	–	1
40	–	–	–	–	–	–	0	–	–	0
1	–	–	–	1	–	–	0	–	–	0
2	–	–	–	0	–	–	0	–	–	1
3	–	–	–	0	–	–	0	–	–	0
4	–	–	–	0	–	–	0	–	–	0
5	1	–	–	0	1	–	0	–	1	1
6	–	–	–	0	–	–	0	–	0	0
7	–	1	–	1	–	–	1	–	1	1
8	–	1	–	–	–	–	–	–	1	1
9	–	–	–	–	–	–	–	–	0	–
50	–	–	–	–	–	–	–	–	0	–
1	–	–	1	–	–	–	–	3	3	–
2	–	–	–	–	–	–	–	1	2	–
3	–	–	–	–	–	1	–	0	1	–
4	–	–	–	–	–	0	–	0	0	–
5	–	–	–	–	–	1	–	1	2	–
56	–	–	–	–	–					
Total	1	2	1	2	1	2	2	5	11	5

Appendix Table 8. Length frequency of other species sampled. G.B. REED, March 22-April 2, 1976.

Fork length (cm)	Eulachon 7 T	Chinook salmon 9 M	Pacific cod 11 F	Pacific cod 12 F	S. diploproa 12 M	S. diploproa 12 F
	Set no. by species					
16	6	-	-	-	-	-
17	23	-	-	-	-	-
18	49	-	-	-	-	-
19	50	-	-	-	-	-
20	32	-	-	-	-	-
21	10	-	-	-	-	-
22	1	-	-	-	-	-
23	-	-	-	-	-	-
24	-	-	-	-	-	1
25	-	-	-	-	-	1
26	-	-	-	-	-	0
27	-	-	-	-	-	0
28	-	-	-	-	-	0
29	-	-	-	-	-	1
30	-	-	-	-	1	1
37	-	1	-	-	-	-
50	-	-	1	-	-	-
68	-	-	-	1	-	-
Total	171	1	1	1	1	4